South River Watershed Restoration Environmental Assessment

South River Field Office
EA # OR-105-00-05
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U.S. Department of the Interior, Bureau of Land Management
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Chapter 1
Purpose and Need for Action

This chapter provides a brief description of the purpose and need for the proposed action being analyzed in this environmental assessment.

Background

The South River Field Office manages lands on the Roseburg District, Bureau of Land Management (BLM) located partially or entirely within nine fifth-field watersheds. The *Roseburg District Proposed Resource Management Plan/Environmental Impact Statement* (PRMP/EIS, October 1994) identified a general degradation of riparian conditions resulting from road construction and past forest management practices. The PRMP/EIS identified 37 percent of the acres of riparian zones in third order and larger streams in minimal condition, 29 percent in fair condition, and 34 percent in good condition on lands administered by the Roseburg District (PRMP/EIS, p. 3-24). The *Roseburg District Record of Decision and Resource Management Plan* (ROD/RMP, June 1995) incorporates the Aquatic Conservation Strategy contained in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD, April 13, 1994). A key component of the Aquatic Conservation Strategy is watershed restoration.

The ROD/RMP (p. 21) states that "The most important components of a watershed restoration program are control and prevention of road related runoff and sediment, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity." (ROD/RMP, p. 21) Management Actions/Directions addressing watershed restoration cite the following priorities: completion of restoration plans prior to restoration activities; focusing restoration on the removal of some roads and , where needed, upgrading remaining roads; applying silvicultural treatments to restore large conifers in Riparian Reserves; and using in-stream structures to restore stream channel complexity in the short term.

Need

There is a need to replace thirteen large culverts which have been identified throughout the Resource Area for one or more of the following reasons: culverts that are at risk of failure; improper installation that is resulting in downcutting of stream banks and channels and generating sediment; under-sized culverts which would not pass a theoretical 100-year flood event; and impeding passage by anadromous and/or resident fish.

There is a need to correct problems associated with roads that have been identified as persistent maintenance problems and/or a regular source of sediment input into aquatic systems, while still providing for management access needs identified in the Transportation Management Objectives. Some of these roads are suitable candidates for decommissioning, while others require upgrading of drainage systems, surfacing with aggregate, and/or stabilization and revegetation of cutbanks and fill slopes.

There is a need to improve the habitat on stream reaches that have been identified which are heavily used by at-risk fish stocks. These streams provide high-quality habitat, but possess less than optimal levels of stream structure and habitat. These streams could provide a much higher level of spawning and rearing habitat for anadromous and resident fish if supplemental structures are provided to: reduce down-cutting of stream channels; reduce under-cutting and erosion of streambanks; trap gravels for spawning beds; provide for floodplain development which would serve as a reservoir for a continuous supply of cold water and flow volume in the hot, dry summer months; and create additional habitat for aquatic organisms on which the fish feed.

There is also a need to reduce sediments from streambanks that are eroding, and revegetate those areas with trees that will provide future shading for maintenance of colder water temperatures necessary to fish, and large wood for in-stream structure.

Purpose

The purpose of the proposed watershed restoration projects is the correction of functional deficiencies in BLM culverts and roads that are affecting water quality and watershed conditions, and the augmentation of properly functioning habit for at-risk fish stocks. Placement of in-stream structures, reduction of sediment, and reestablishment of passage for resident and anadromous fish by replacement of culverts in streams where migratory routes have been impaired would enhance and extend in-stream habitat for at-risk fish stocks and other aquatic organisms. Decommissioning of selected roads and the renovation and/or upgrading of other roads would benefit aquatic systems and organisms by reducing erosion and sedimentation, and stabilizing flow regimes. It is anticipated that the individual projects would be implemented over a period of five years.

This environmental analysis serves to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a finding of no significant impact (FONSI). It will consider the environmental consequences of the proposed action and no action alternatives, in the short term and long term, on a project level and at the fifth-field analytical watershed level.

Implementation of the proposed action would conform to standards and guidelines contained in the Roseburg District *Record of Decision and Resource Management Plan* which is tiered to and incorporates the analysis contained in the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl and the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.*

Chapter 2
DISCUSSION OF THE ALTERNATIVES

This chapter describes the basic component features of the alternatives being analyzed in this environmental assessment.

I. Alternative 1 - Proposed Action

This alternative proposes watershed restoration projects in the Lower Cow Creek, Myrtle Creek, Olalla-Lookingglass, South Umpqua River, and Upper Middle Fork Coquille fifth-field watersheds. These areas are addressed in the following Watershed Analyses: John Days Coffee, September 1995; Stouts-Poole-Shively/O'Shea, January 1996; Myrtle Creek, January 1997; Cow Creek, September 1997; Olalla-Lookingglass, April 1998; Canyonville/Canyon Creek, December 1998; and Upper Middle Fork Coquille, May 1999.

Thirteen large culverts are proposed for replacement. These culverts have been identified for replacement by Field Office and District engineering personnel because of the risk for near-term failure. The objective would be to "Preclude stream crossings from being a direct source of sediment to streams thus minimizing water quality degradation and provide unobstructed movement for aquatic fauna." The replacement culverts would be designed to pass a theoretical 100-year flood event and would equal or exceed bankfull width in order to prevent constriction of the stream channel which would increase stream velocities below the structures.

Design of the culverts would also, to the extent practical, simulate the natural stream channel. Most of the culverts would be designed with one to ten grade controls in order to raise the level of downcut channels created by the previous installations, and provide passage for anadromous and/or resident fish, where present. Culvert bottoms could also be lined with concrete in which natural substrates are embedded in order to mimic natural stream bed conditions and help reduce flow velocities. A summary of the culvert replacement proposals is displayed by Table 1.

Approximately four miles of stream channels have been identified as candidates for tree-lining or placement of in-stream structures. The placement of these structures has the multiple objectives of reducing stream velocities; trapping sediment and substrates; assisting in floodplain development; reducing channel down-cutting; and providing habitat components that would provide expanded spawning, rearing and feeding opportunities for resident and anadromous fish. Structures would consist of logs greater than 24 inches in diameter with root wads attached where practical, and/or large rip-rap and boulders. Sources for logs could include; BLM timber blown down on or alongside roads and transported to project sites; BLM timber felled or pulled over from areas adjacent to project sites; or BLM timber cut or pulled over and transported to project sites. Rock would be obtained from established quarry sites or purchased from private sources. The Riparian Reserve on the unnamed tributary to the West Fork of Canyon Creek would be planted with conifers in keeping with the objective (ROD/RMP, p. 21) of restoring large conifers. These proposals are summarized in Table 2.

Best Management Practices would be incorporated into project design and implementation associated with culvert replacement, tree-lining or placement of in-stream structures. These Best Management Practices and other project design features are intended to reduce the potential affects on water quality and aquatic/riparian habitat and could include the following:

- Use existing roadways or travel paths for access to project sites.
- Avoid the use of heavy equipment and techniques that would result in excessive soil disturbances or compaction of soils, especially on steep or unstable slopes.
- Vehicles and machinery must cross streams at right angles to the main channel whenever possible.
- Excavation or transport equipment/machinery should be limited in capacity, but sufficiently sized to complete required restoration activities.
  Sedimentation and erosion controls must be implemented on all project sites where the implementation of restoration activities would result in soil and/or slope disturbances.
- Installed culverts should be aligned to stream flows and positioned at or below stream grades.
  Culvert inlets and outfalls should be properly protected (e.g., rock armored) to prevent future scouring actions and erosion hazards.
- Revegetate bare soils with native vegetation as soon as possible.

Where tree-pulling or felling would be used to place structure in streams, the following criteria would be considered in selection of trees, in order to mitigate the potential affects on habitat for the northern spotted owl and marbled murrelet.

- Select trees that are located in an existing opening.
- Avoid trees with visible, suitable nesting structure, or select trees with few limbs.
- Avoid dominant trees, especially those that contribute in large measure to the canopy closure and shading of a given area.
- Select species other than Douglas-fir whenever practicable.

To mitigate the potential affects of disturbance from activities associated with tree-pulling and felling, seasonal restrictions would be implemented for planned activities that would occur within a ¼ mile of occupied spotted owl sites or unsurveyed suitable habitat for marbled murrelets.

Table 3 summarizes the proposed road renovation included in this analysis. Approximately 9.67 miles of road would be renovated or upgraded to improve drainage and reduce surface erosion. Some portions of the road cut and fill slopes would be armored with large rock, sections of the road would be surfaced with aggregate, exposed road banks would be revegetated, and several inadequate stream crossings which are a chronic source of sediment to Days Creek would be replaced. Rock would be supplied from existing quarries and maintenance stockpiles, or would be purchased from private sources.

A summary of proposed road decommissioning is contained in Table 4. The objective of decommissioning would be to provide for hydrological recovery and reduction of sediment input into aquatic systems. Road decommissioning could include the removal of stream crossings, removal of cross-drain culverts, pull-back of fill slopes, obliteration of ditch lines, subsoiling and revegetation of the road surfaces, and blocking or waterbarring.

The final action proposed in this alternative is the stabilization of a severely eroding portion of stream bank on Days Creek. Table 5 summarizes the proposed action which would involve diversion of the creek away from the toe of the eroding slope by the placement of in-stream structures. The bank would be pulled back to a stable angle of repose and revegetated.

Table 1 - CULVERTS PROPOSED FOR REPLACEMENT (all values are approximations)

Project Site	Approx. acres that could be disturbed	Approx. feet of stream channel that could be affected by placement of grade structures above and below the road prism	Approx. number of structures to be placed below culverts	Diameter of timber that could be cut in project area.	Number of trees to be imported to for grade structures
Bingham #1 (Rd.29-9-26.0)	0.30	40/130	8	6"-24"	6
Bingham #2 (Rd.29-9-26.0)	0.30	40/130	3	6"-24"	2
Weaver Creek (Rd.28-3-33.0)	0.60	40/130	4	6"-24"	3
St. John Creek (Rd.30-3-34.1)	0.80	60/250	10	6"-24"	9
East Fork St. John Creek (Rd.30-3-34.1)	0.30	30/70	2	6"-24"	2
Days Creek Tributary #1 (Rd.29-3-33.0)	0.30	30/70	2	6"-24"	3
Days Creek Tributary #2 (Rd.29-3-33.0)	0.30	30/70	2	6"-24"	3
Days Creek Tributary #3 (Rd.29-3-33.0)	0.60	30/150	5	6"-24"	5
Russell Creek (Rd.30-6-35.1)	0.30	30/70	2	6"-24"	2
Suicide Creek (Rd.29-8-2.0)	0.30	30/70	2	6"-24"	2
Union Creek (Rd.31-8-3.0)	0.40	30/70	5	6"-24"	4
Live Oak Creek (Union Creek Access Rd.31-7-19.0)	0.60	30/70	4	6"-24"	4
East Fork Stouts Creek (Rd.30-3-10.1)	1.20	30/30	1	6"-16"	4

Criteria to be met for Culverts:

1) Pass 100-year flood.
2) Fish passage is required at each culvert.

Additional information for each culvert:

1) An access road up or down the stream channel will be needed.
2) There are no active no mining claims involved.
3) Width of vegetated riparian area to be impacted, excluding the road prism, is 50 feet.
4) One structure is anticipated above culverts.
5) Estimates of length of stream channel that could be affected by the placement of grade control structures are based on anticipated access needs for equipment.

Table 2 - **PROPOSED IN-STREAM STRUCTURES PLACEMENT** (all values are approximations)

Project Description	Miles of stream impacted	Existing access ? Y/N	Will new access points be needed ? Y/N estimated number and length	Number of trees to be pulled into creek*	Number of trees to be felled into creek*	Number of trees to be imported to the site*
Thompson Creek (T30S,R7W,Section 3)	0.75	Y	N	20 - 30	10 - 20	N/A
Days Creek (T29S,R3W,Section 23)	1.5	Y	Y 10 - (50' to 300')	10 - 20	10 - 20	30 - 40
Days Creek (T29S,R3W,Section 27)	1.5	Y	Y 10 - (50' to 300')	10 - 20	10 - 20	30 - 40
Tributary of West Fork Canyon Creek (T31S,R5W,Section 10)	0.30	Y	Y 8 - (50' to 100')	0	0	15-20

* Numbers are approximate and represent the maximum anticipated number of trees pulled, cut, or imported.

Structures will be designed & engineered in a manner that will minimize risks to the environment and private property.

Table 3 - PROPOSED ROAD RENOVATION (all values are approximations)

Project Description	Length in Miles
Days Creek Road No. 29-3-33.0	9.34
Road No. 29-4-23.1, Segment A	0.33

Table 4 - PROPOSED ROAD DECOMMISSIONING (all values are approximations)

Project Description	Length in Miles
Road No. 29-4-23.1, Segment B	0.25
Road No. 31-5-10.0 Segment "A"	1.46
Road No. 31-5-10.1 Segment "B"	0.39
SPUR 1 (Creek Bottom Road in S½SE¼, Sec.10,T31S,R5W)	0.30
SPUR 2 (Road in E½NW¼, Sec.10,T31S,R5W)	0.20

TABLE 5 - DAYS CREEK STREAM BANK STABILIZATION (all values are approximations)

Project Description	Access	Number of structures	Length of channel impacted	Area above the Stream Bank that will be Excavated & End Hauled Acres	Estimated number of trees to be cut
Days Creek (T29S,R3W,Section 27)	Utilize existing skid roads on the flood plain. for structure placement. Build access for slope pullback and end-haul.	5-10	approx. 300'	1	2-5

The spread of noxious weeds is a concern that must be addressed in all proposed management actions. Potential mitigative actions have been identified that would reduce the likelihood of introducing weeds into areas where they do not presently exist, or spreading weeds from areas that are presently infested. These measures may include:

- Cleaning BLM earth moving and excavation equipment prior to move-in on a site, or transport to another site.
- Requiring contractors to clean equipment prior to move-in or transport to additional sites on public land.
- Revegetation of disturbed areas as soon as practical using native species whenever possible.
- Requiring the use of certified weed free seed for all commercially grown seed used in revegetation projects.
- Scheduling work on weed-free sites first, to reduce the likelihood of introduction of weeds from infested sites.

II. Alternative 2 - No Action

The watershed restoration opportunities identified in this analysis would not be pursued at this time. Restoration opportunities identified in this environmental assessment would require a future analysis for authorization and implementation.

Culverts identified as having a high risk of near-term failure would not be replaced at this time. Sediment problems caused by improperly functioning culverts would not be corrected, and where applicable, fish passage would not be restored. The possibility of near-term culvert failure would continue to pose a risk to private properties located downstream, and to resource values that include soil productivity, water quality, aquatic habitat and riparian habitat.

There would be no tree-lining or placement of in-stream structures to provide additional habitat structure for fish and other aquatic species. Present levels of habitat availability and function would remain unchanged unless subject to future man-caused or natural disturbances. No reforestation of the Riparian reserve on an unnamed tributary to the West Fork of Canyon Creek would be undertaken.

No road renovation or decommissioning would occur. Present surface erosion, run-off and sediment problems identified in the proposed alternative would persist unless addressed in a separate analysis. No reduction in current densities of roads and stream crossings would occur.

The eroding bank on Days Creek would continue to contribute large amounts of sediment to the aquatic system in the absence of stabilization and revegetation.

III. Elements of the Human Environment That Would Not Be Affected by Either Alternative

The following Critical Elements of the Human Environment would not be affected by the adoption of either alternative, and will not be discussed further in this analysis: Air Quality; Areas of Critical Environmental Concern; Environmental Justice; Prime or Unique Farm Lands; Wastes, Hazardous or Solid; Wild and Scenic Rivers; Wilderness; and Visual Resource Management.

IV. Alternatives Considered but Eliminated From Detailed Study

Two additional actions were initially proposed for implementation in the Days Creek area.

A. Excavation of a new stream channel was considered as a means of diverting Days Creek away from the slope that it is undercutting and eroding. Excavation of a new stream channel would generate more sediment than the eroding slope is currently creating, the affects of which would persist for at least three years. Access for equipment and actual excavation of the channel would remove trees and vegetation that are providing shade and thermal regulation within the Riparian Reserve. Neither of these consequences would be compatible with the stated objectives of reducing sediment and maintaining riparian vegetation and timber for shading and the maintenance of cold water temperatures.

B. A second proposal was the decommissioning of approximately 3 miles of the 29-3-33.0 road in the Days Creek subwatershed, from the junction with the 29-3-13.2 road, northeast to the junction with the 29-3-11.0 road, at a point located above the Tater Hill Area of Critical Environmental Concern/Research Natural Area. This proposal would not meet Transportation Management Objectives, because the road is needed for future timber management and reforestation access, and provides access to and from the Myrtle Creek watershed for fire suppression purposes.

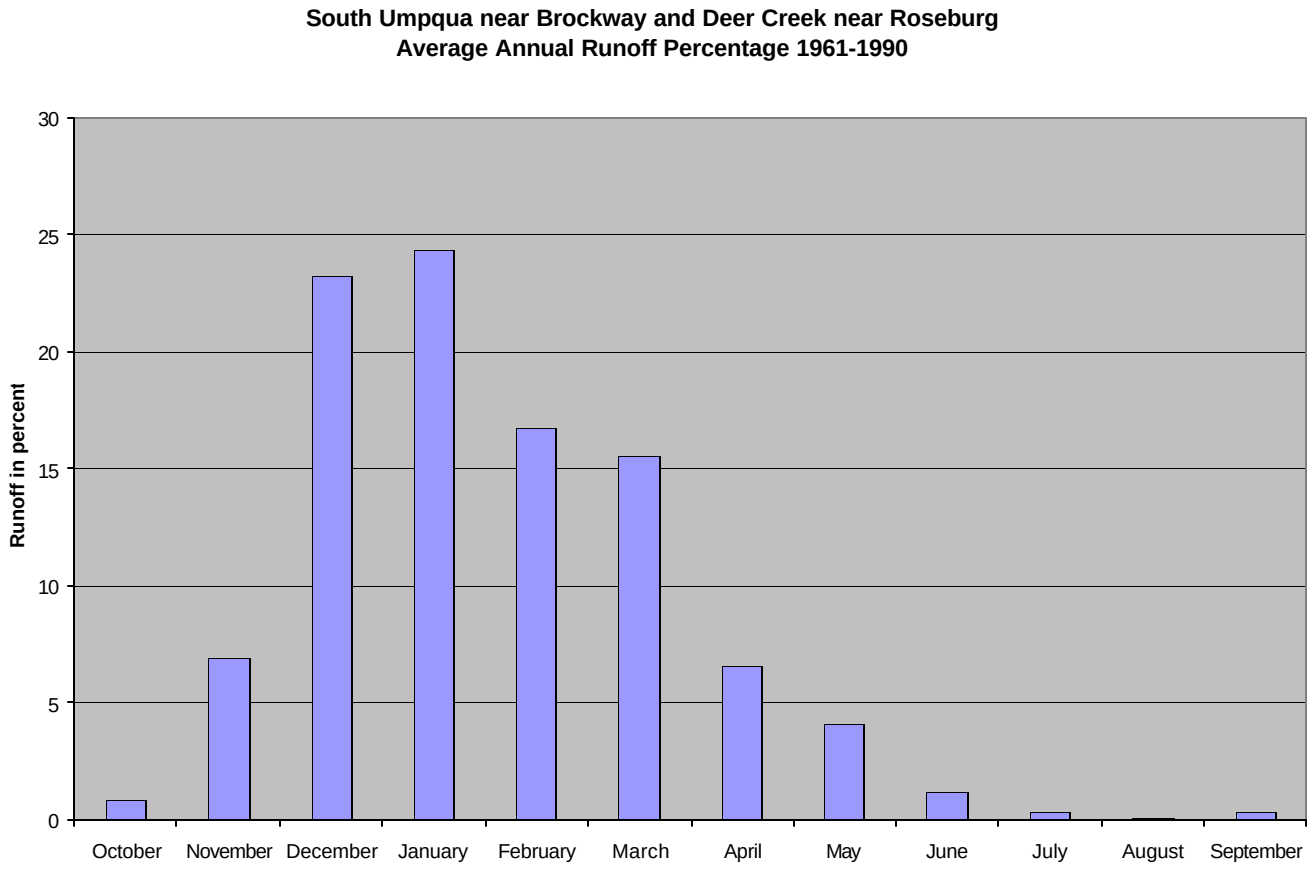
Chapter 3
AFFECTED ENVIRONMENT

This chapter discusses the specific resources that are present or have the potential to be present within the area and could be affected by the proposed action.

I. Water Resources

Peak stream flows occur between November and March. Low flows occur from July to October and are characterized by extremely low base flows, and occasionally, dry stream channels. Figure 2 illustrates typical timing of runoff over the course of the year.

Figure 2



Water quality standards are determined for each water body by the Oregon Department of Environmental Quality (ODEQ). These standards are designed to protect each water body for its most sensitive beneficial use. The most sensitive beneficial use in the affected streams is for resident fish and aquatic life and for salmonid fish spawning and rearing (Miner 1996, p. 1). Additional uses are water for terrestrial wildlife; irrigation; livestock watering; and industrial, municipal and domestic water supply.

Several streams or stream reaches in the affected watersheds do not meet water quality standards and are listed by the ODEQ in the 1998 Water Quality Limited Streams-303(d) List) for a variety of deficient environmental parameters. The majority of listings are for elevated temperature and habitat modification. Elevated temperatures are primarily due to a lack of stream shading resulting in a high level of direct solar radiation, and/or low summer flows. Most listings for habitat modification are due to a lack of large wood and quality pool rearing areas. There are only 3 current listings for sediment, but many streams are impaired by excess fine sediment and are likely to be listed as evaluations continue.

Culverts are frequently a major source of sediment input to streams, resulting from downcutting of stream channels and banks at the outflow of the culverts, or as a result of water seeping under culverts (BLM. Coos Bay District. 1998). Culverts would also pose a risk to downstream properties, water quality, stream structure, proper stream function, and aquatic/riparian habitat in the event of a catastrophic failure.

Thompson Creek, proposed for tree-lining under Alternative 1 of this analysis, is identified (ODEQ 1998) as moderately water quality limited. Among the limiting factors identified are sedimentation, streambank erosion, and decreased flow (Olalla-Lookingglass Watershed Analysis, p. 71).

Roads have the potential to extend drainage networks, are a potential source of sediment to streams, and can affect peak flows by direct routing of surface runoff (Wemple et. Al. 1996). Road densities above 3 miles per square mile were identified as one cause of improper watershed function in the National Marine Fisheries Service LRMP/RMP Programmatic Biological Opinion and Conference Opinion, March 18, 1997. In the Lower West Fork drainage of the Canyon Creek subwatershed, road densities for all ownerships are 3.76 miles per square mile. (Canyonville/Canyon Creek Watershed Analysis, p. 55) Road densities for all ownerships in the Lower Louis Creek drainage of the Upper South Myrtle subwatershed are 3.94 miles per square mile. (Myrtle Creek Watershed Analysis, Appendix B)

Days Creek, proposed for bank stabilization and placement of in-stream structures, has been identified as moderately water quality limited for turbidity, erosion and low flows (ODEQ, 1998). Stream surveys by the Oregon Department of Fish and Wildlife identified deficiencies in large woody debris, pool frequency, and a high channel width to channel depth ratio as habitat elements and channel conditions that were not properly functioning in the Days Creek subwatershed.

The upper reaches of the 29-3-33.0 road (Days Creek Road) has been a persistent maintenance problem and source of continuing sediment input into Days Creek. Engineering, soils, fisheries and hydrology staff have identified a lack of sufficient numbers of cross drains and relief culverts for proper drainage during periods of high flows. Many of the culverts in place are undersized and become plugged, resulting in diversion of water down road surfaces. Surface erosion can transport sediment down slopes and into drainage systems from which it can be transported into streams. (Elliot, W. J., et. al. 1996).

II. Special Status, Special Attention and Riparian Associated Species

Special Status Species are those species that are listed or proposed for listing under the Endangered Species Act, Bureau Sensitive species designated under BLM 6840 policy, and Bureau Assessment species designated under Oregon/Washington BLM 6840 policy.

Bureau Sensitive species are species that are eligible for federal listing as threatened or endangered, or are already candidates for listing under the Endangered Species Act. Bureau Sensitive species include species designated as State threatened or endangered by the State of Oregon. Bureau Assessment species are not presently eligible as candidates for listing under the Endangered Species Act. Bureau Assessment species include species identified by the State of Oregon for which there is a concern for persistence. These species may require special consideration or protection in the implementation of BLM management actions.

Special Attention species are those species designated for protection under Survey and Manage and/or Protection Buffer standards and guidelines in the Northwest Forest Plan, and incorporated into the Roseburg District ROD/RMP. These are not considered special status species, unless otherwise classified. Where a species is listed as both special status and special attention, it is discussed under its special status classification.

Riparian associated species are species identified in the report of the Forest Ecosystem Management Assessment Team (FEMAT) which are associated with late-successional and old-growth forest, utilizing streams, wetlands and riparian areas (FEMAT, Table V-1, p. V-12). The FEMAT report states that "Riparian Reserves will also protect wet micro-sites, seeps, and springs, that are important for maintaining associated arthropods, mollusks, bryophytes, vascular plants, and amphibians." (FEMAT, p. IV-189)

Other than for species listed under the Endangered Species Act, BLM management policy for wildlife is not applicable on privately-owned lands on which the BLM has constructed and maintains roads and culverts under rights-of-way or easements. Management for Bureau Sensitive, Bureau Assessment, Survey and Manage, and Protection Buffer species and their habitat is applicable on public lands administered by the BLM.

A. Terrestrial Wildlife

The following species inhabit lands managed by the Roseburg District: the Federally-endangered Columbian White-tailed deer (*Odocoileus virginianus leucurus*), the Federally-threatened marbled murrelet (*Brachyramphus marmoratum*), the Federally-threatened northern spotted owl (*Strix occidentails caurina*), and the Federally-threatened bald eagle (*Haliaeetus leucocephalus*). The Columbian White-tailed deer and the bald eagle are not expected to occur in any of the proposed project areas based on the lack of suitable habitat. The northern spotted owl is known to inhabit areas proposed for restoration activities, and the marbled murrelet may be present in other project areas based on their location within the management zone for this species.
The Federally-threatened Canada Lynx (*Lynx canadensis*), Federally-endangered Fender's Blue Butterfly and the Federally-threatened vernal pool fairy shrimp have not been documented on the Roseburg District. Suitable habitat for these species is lacking. The Canada Lynx preys primarily on snowshoe hare which are not known to inhabit lower elevations in which proposed projects areas are located. Fender's Blue Butterfly larvae feed primarily on Kincaid's lupine, of which there are only three known occurrences in the South River Resource Area. As a consequence, there will be no further discussion of these species in this analysis.

1. Federally Threatened and Endangered

Federally-threatened marbled murrelet

The reach of Thompson Creek proposed for tree-lining is the only project area within the Marbled Murrelet Management Zone that is located within a ¼ mile of suitable habitat. Occupancy surveys and consultation with the U.S. Fish and Wildlife Service would be required wherever projects have the potential to affect murrelets through removal of suitable habitat, or where activities would create noise disturbance could result in nest abandonment.

Federally-threatened northern spotted owl

The proposed Thompson Creek tree-lining project is located in suitable nesting, roosting and foraging habitat. Two home ranges and the 100-acre core area surrounding the activity center of one owl pair overlap the project area. This area is also within a critical habitat unit (CHU OR-62) designated by the U.S. Fish and Wildlife Service.

The area proposed for in-stream structure placement and road decommissioning in the West Fork Canyon Creek does not contain any suitable nesting, roosting or foraging habitat, nor is the area within the 1.3 mile radius home range for any owl pairs. Timber located approximately one mile east of the project area has been identified as suitable material for in-stream structures. This timber is considered suitable habitat, but is not within the home range of any owl pair.

The proposed Days Creek in-stream work and proposed renovation of the 29-3-33.0 road from a point in the north half of Section 27, T. 29 S., R. 3 W. to the junction with the 29-3-11.0 road overlaps the home ranges of four owl pairs, and is within a ¼ mile of the core areas of two of those pairs. The culvert proposed for replacement in Section 13, T. 29 S., R. 3 W. is within a ¼ mile of a core area. Habitat in the project areas is characterized as dispersal habitat. Riparian Reserves in the Days Creek subwatershed provide approximately 2,500 acres of dispersal habitat.

The area where proposed renovation of the portion of the 29-4-23.1 road that crosses privately-owned land and proposed decommissioning of the remainder of the road is located within the home range of three owl pairs, but not within ¼ mile of any core area.

The proposed culvert replacement on Weaver Creek, in Section 33, T. 28 S., R. 3 W. is located within a ¼ mile of an owl core area. Suitable nesting, roosting and foraging habitat is present on the opposite side of the creek from where the culvert replacement is proposed.

Occupancy surveys and consultation with the U.S. Fish and Wildlife Service would be required wherever projects have the potential to affect owls or designated Critical Habitat.

2. Federal Candidate

There are no Federal Candidate terrestrial species documented on the Roseburg District.

3. Bureau Sensitive

Ten species identified as Bureau Sensitive are known to inhabit or utilize riparian areas for foraging. These species include the northern goshawk, olive-sided flycatcher, white-footed vole, fringed myotis bat, long-legged myotis bat, Yuma myotis bat, northern red-legged frog, foothill yellow-legged frog, Oregon megomphix snail, and the Del Norte salamander.

Suitable habitat for the northern goshawk and foothill yellow-legged frog is not present in the West Fork Canyon Creek area where road decommissioning and in-stream structure placement is proposed, nor in the vicinity of any of the proposed replacements of large culverts. These species may be present in the Thompson Creek and Days Creek areas where in-stream work is proposed.

Proposed restoration activities in the West Fork Canyon Creek are located within 25 miles of documented Del Norte salamander populations. No suitable habitat has been identified in the specific activity areas. Del Norte salamanders are not expected to be present, no impacts would be anticipated, and no further discussion is necessary relative to this project site.

The area of Thompson Creek proposed for tree-lining, and areas of the Days Creek subwatershed in which in-stream structure placement, bank stabilization, road renovation and culvert replacement are proposed are mostly within 25 miles of documented sites populated by the Del Norte salamander, but have not yet been surveyed for the presence of suitable habitat.

4. Bureau Assessment

The merlin (*Falco columbarius*) is the only Bureau Assessment species that is suspected to occupy or use habitat that exists in the vicinity of any proposed projects. The merlin generally hunts in openings and clearings, and occupies nearby forested areas. Surveys for northern goshawks would be expected to identify merlin occupancy.

5. SEIS Special Attention Species

Five Survey and Manage species have been identified that may be present at various project sites located on public lands administered by the BLM.

The red tree vole (*Arborimus longicaudus*) may inhabit timbered stands in the vicinity of the reach of Thompson Creek proposed for tree-lining and felling, the Weaver Creek culvert site, the Bingham Creek culvert site in Section 27, and the reaches of Days Creek proposed for in-stream structure placement.

The blue-gray tail-dropper (*Prophysaon coeruleum*) and Papillose tail-dropper (*Prophysaon dubium*) are suspected to inhabit the Thompson Creek and Days Creek sites. Blue-gray tail droppers have been documented at the Weaver creek site, but neither species was identified at the Bingham Creek and Canyon Creek sites. They may also be present along the portion of the 29-4-23.1 road that has been identified for decommissioning.

Two other species of terrestrial mollusks have been identified as possible inhabitants of project sites. The Crater Lake Tightcoil snail (*Pristiloma arcticum crateris*) may inhabit areas within the Days Creek subwatershed. The Oregon Shoulderband snail (*Helminthoglypta hertleini*) may be present in the Canyon Creek area where trees could be obtained for in-stream work, and has been documented along portions of the site of proposed in-stream work in the tributary to the West Fork Canyon Creek.

B. Fish

1. Federally Threatened and Endangered

The Umpqua River cutthroat trout (*Oncorhynchus clarki clarki*) was listed by the National Marine Fisheries Service as an endangered species under the Endangered Species Act of 1973, as amended (Federal Register, Vol. 61, No. 155/ August 9, 1996/ Rules and Regulations), and its presence has been documented in four of the five fifth-field watersheds encompassed by the proposed alternative.

Critical habitat was also designated. On April 5, 1999, the National Marine Fisheries Service proposed delisting of the species based on a determination that the species is not an Evolutionary Significant Unit. In a Federal Register notice on April 19, 2000 (Federal Register, Vol. 65, No. 76/ Wednesday, April 19, 2000/ Rules and Regulations, pp. 20915-18), the National Marine Fisheries Service formally announced the delisting. The U.S. Fish and Wildlife Service concurred with the decision in an announcement on April 26, 2000. With the delisting of the species, there is no longer any designated critical habitat. As a consequence, there will be no further discussion of the species in this analysis.

The National Marine Fisheries Service has also listed the Oregon Coast coho salmon (*Oncorhynchus kisutch*) Evolutionary Significant Unit. The species was listed as a threatened species (Federal Register, Vol. 63, No. 153/Monday, August 10, 1998/Rules and Regulations) and has been documented in all of the fifth-field watersheds encompassed by the proposed alternative. Critical habitat has not been designated.

2. Federal Candidate

The Oregon Coast steelhead trout (*Oncorhynchus mykiss*) were considered for proposed listing by the National Marine Fisheries Service as a threatened species under the Endangered Species Act. The species is presently considered a candidate for listing (Federal Register, Vol. 63, No. 53/Thursday, March 19, 1998/Rules and Regulations) and has been documented in all five of the fifth-field watersheds encompassed by the proposed alternative.

3. Bureau Sensitive

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The Pacific lamprey (*Lampetra tridentata)* and Umpqua chub (*Oregonichthys kalawatseti*) are on the United States Fish and Wildlife Service list of Species of Concern and are considered Bureau Sensitive (BLM Manual 6840). The Pacific lamprey is distributed in all five of the fifth-field watersheds encompassed by the proposed alternative. The Umpqua chub has been documented by the Oregon Department of Fish and Wildlife in the South Umpqua Watershed in the mainstem of the South Umpqua River. There are presently no specific requirements for the management of these species. Actions that are consistent with the objectives of the Aquatic Conservation Strategy are considered to provide ample protection for these species. As a consequence, no further discussion of these species is necessary in this analysis.

The Oregon Department of Fish and Wildlife (ODFW) has conducted aquatic habitat inventories in a majority of the drainages that would be affected by the proposed restoration activities. The current aquatic habitat ratings for these streams are identified as “fair” and “poor”. The ODFW “fair” rating equivalent to an “at risk” determination and the “poor” rating is equivalent to a “not properly functioning” determination in the National Marine Fisheries Service Matrix of Pathways and Indicators (USDC 1996). Table 6 summarizes habitat conditions for streams proposed for habitat restoration activities.

Table 6 - Current Aquatic Habitat Conditions

STREAM	SUBWATERSHED /DRAINAGE(s)	ODFW RATING	NMFS RATING
Bingham Creek*	Camas Valley/ Bingham	N/A	N/A
East Fork Stouts Creek	Stouts Creek/East Stouts	Fair	At Risk
Days Creek	Days Creek/Middle Days & Upper Days	Fair	At Risk
Russel Creek	Riddle/Russel Creek	Fair	At Risk
St. John Creek	St. Johns/East Fork St. Johns	Fair	At Risk
Suicide Creek	Shields/Suicide Creek	Fair	At Risk
Thompson Creek	Thompson/Thompson Creek	Fair	At Risk
Union Creek	Upper Cow/Upper Union	Fair	At Risk
Weaver Creek	Upper South Myrtle/ Weaver Creek	Poor	Not Properly Functioning
Unnamed Tributary to West Fork Canyon Creek	Canyon Creek/Lower West Fork	Fair	At Risk

* ODFW Habitat Inventory Protocol has not been conducted in this stream. However, based on Proper Functioning Condition Surveys (USDI TR1737-15, published 1988) conducted, summer 1998-99, Bingham Creek was identified as "at risk/downward trend".

Table 7 summarizes the presence of anadromous and resident fish species in streams on which replacement of culverts are proposed. The table also summarizes current passability and additional habitat availability anticipated following the culvert replacements.

Table 7 - Summary of Species Presence and Culvert Passability

CULVERT PROJECT NAME	MILES OF FISH HABITAT UPSTREAM FROM CULVERTB	SALMONID FISHES LOCATED ON-SITE OR IMMEDIATELY DOWNSTREAM FROM CULVERT	CURRENT FISH ACCESS TO UPSTREAM HABITAT (Y/N)	
			Anadromous	Resident
Bingham Creek #1	1.25	cutthroat trout	N/A	N
Bingham Creek #2	0.25	cutthroat trout	N/A	N
Weaver Creek	1.0	cutthroat trout, steelhead trout, coho salmon	N	N
St. John Creek #1	2.0	cutthroat trout, steelhead trout, coho salmon	N	N
St. John Creek #2	1.5	cutthroat trout	N	N
Days Creek #1	0.5	cutthroat trout, steelhead trout, coho salmon	N	N
Days Creek #2	0.25	cutthroat trout, steelhead trout, coho salmon	Y	Y
Days Creek #3	0.5	cutthroat trout, steelhead trout, coho salmon	Y	Y
Russel Creek	2.5	cutthroat trout, steelhead trout, coho salmon	Y	Y
Suicide Creek	3.0	cutthroat trout, steelhead trout, coho salmon	Y	Y
Union Creek	2.0	cutthroat trout	N/A	N
Live Oak Creek	1.0	cutthroat trout	N/A	N
EF Stouts Creek	0.0	nonfish-bearing (electrofish data, 1995)	N/A	N/A

B Information derived from Watershed Analyses; personal observation and stream habitat surveys; and fish presence/absence surveys. These are all approximated stream lengths.

N/A Access for anadromous and/or resident fishes is blocked by natural barrier(s) located downstream from culvert site.

C. Plants

1. Federal Candidate

Based on the availability of suitable habitat, the wayside aster (Aster vialis), tall bugbane (*Cimicifuga elata*) and clustered lady's slipper (*Cypripedium fasciculatum*) may be present on any of the proposed project areas. Kincaid's lupine (*Lupinus sulphureus var. kincaidii*) has been previously identified in the Letitia Creek drainage and could also occur in the Days Creek and Lower Louis Creek areas in which projects are proposed. This lupine may also be present in the Canyon Creek subwatershed in the NE¼ NE¼ of Section 14, T. 31 S., R. 5 W., where removal of trees is proposed for use as in-stream structures in T. 31 S., R.5 S., Section 10.

2. Bureau Assessment

California sword fern (*Polystichum californicum*) inhabits rock outcrops, which could include road cutbanks. Based on available habitat, the species could occur in the Thompson Creek and West Fork Canyon Creek areas.

3. SEIS Special Attention Species

The following vascular and non-vascular plants may occur within proposed project sites dependent upon the types of available habitat present.

Vascular Plants
Allotropa virgata

Lichens
Hypogymnia duplicata
Lobaria linita
Pseudocyphellaria rainierensis

Bryophytes
Buxbaumia viridis
Diplophyllum plicatum
Kurzia makinoana
Marsupella emarginata aquatica
Schistostega pennata
Tetraphis geniculata
Tritomaria exsectiformis
Ulota megalospora.

Fungi
Aleuria rhenana
Bondarzewia montana
Otidea leporina
Otidea onotica
Otidea smithii
Polyozellus multiplex
Sarcosoma mexicana

D. Riparian Associated Species

In addition to the two species identified as SEIS Special Attention Species, five other species of terrestrial mollusks are documented as inhabitants of riparian environments. These include *Ancotrema sportella, Haplotrema vancouverense, Prophysaon andersoni, Vertigo columbiana*, and *Ariolimax columbianus*. Four species of salamanders which include Dunn's, Pacific giant, clouded, and the rough-skinned newt, are also dependent on riparian habitats**.** In addition, many species of

migratory songbirds, waterfowl, raptors, mammals and reptiles use riparian habitat as primary or secondary habitat. (Brown, 1985) In general, information on the distribution and abundance of any of these species is either lacking or incomplete.

II. Soils

Sites for proposed restoration activities are located in the Western Cascades, Klamath Mountain and Coast Range geomorphic divisions. Based on the geologic complexity and major changes in parent material, soil types can be extremely variable. Geological information is contained in the Geologic Map of Oregon (Walker and MacLeod, 1991) and Geologic Compilation Map of Douglas County (Beaulieu and Ramp,1972). Soils data was provided by the Douglas County Soil Survey (Natural Resource Conservation Service, 1994, unpublished).

The Weaver Creek, Days Creek and the 29-4-23.1 road in South Myrtle Creek project sites are within the Klamath Mountain geomorphic division. The Days Creek subwatershed also contains soils from the Western Cascades geomorphic division. These soils are primarily formed from granitic or volcanic parent rock and residual materials. These soils are both colluvial and alluvial, having accumulated on and at the base of steep slopes, and having been deposited by streams and rivers. Soil depths range from 40 inches to 60 inches over bedrock, on average, though some areas may only be 20 inches to 40 inches deep while others are in excess of 60 inches deep. The soils are generally well-drained but water tables can be expected to rise to within two feet of the surface during the wet season. Soil textures range from loamy to clayey.

Soils on the East Fork Stouts Creek project site are characterized by mica schist, and the St. John Creek project sites by mica schist and other metamorphic colluvium. These soils are of the Klamath Mountain geomorphic division and are typically 40 inches to 60 inches deep over bedrock, have loamy textures, and are well-drained.

Soils in the West Fork Canyon Creek project site are in the Klamath Mountain geomorphic division and are formed from colluvial and residual metamorphic material. Soil depth is generally 40-60 inches to bedrock with lesser areas of 20-40 inches to bedrock. These soils are well drained and have gravelly loam textures. Soils at the Russell Creek project site are formed from mixed alluvium, also in the Klamath division. Soil depth is generally greater than 60 inches to bedrock. These soils are well drained, have loamy textures, and occur on alluvial fans.

The Thompson Creek in-stream project site is also within the Klamath Mountain gepmorphic division and is characterized by colluvial and alluvial soils from conglomerate and metamorphic material. Soils are generally 20-40 inches to bedrock with some areas 40-60 inches deep. These soils generally have gravelly loam texture and are well-drained.

Soils are typically sedimentary in origin, composed of sandstones, siltstones, mudstones and conglomerates. Soils may be colluvial and alluvial with residual material. Metamorphic soils may also be present. Soils are loamy in texture and depth is generally greater than 60 inches to bedrock. Soils at the Bingham Creek sites have a water table within 2 feet of the surface during the wet season. Soils on the Union Creek, Suicide Creek, and Live Oak Creek project sites tend to be well-drained.

IV. Noxious Weeds

Noxious weeds are spreading throughout the Roseburg District. Exact figures are not available, but the BLM Oregon State Office reported that the acreage of noxious weeds infestation increased at the rate of 14% a year between 1985 and 1991 nation wide (Asher 1993). This would equate to an increase of at least 1,000 acres annually on the Roseburg District (USDI, Bureau of Land Management, Roseburg District. *Integrated Weed Control Plan* and Environmental Assessment. 1995. p. 7)

The Oregon Department of Agriculture has developed a rating system for noxious weeds comparable to that contained in BLM Manual 9015 - Integrated Weed Management. The Oregon Department of Agriculture Noxious Weed Rating System designates weeds as types "A" "B", and "T", equivalent to types "A", "B", and "C" described in BLM Manual 9015 - Integrated Weed Management. Species may be classed in multiple categories.

> Type "A"weeds are weeds of known economic importance which occur in the State in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states make future occurrence in Oregon seem imminent.
>
> Type "B" weeds are weeds of economic importance which are regionally abundant, but which may have limited distribution in some counties. Where implementation of a fully-integrated statewide management plan is infeasible, biological control shall be the main control approach.
>
> Type "T" weeds are priority noxious weeds designated by the State Weed Board as target weed species on which the ODA will implement a statewide management plan.
>
> Examples of noxious weeds documented in the South River Resource Area include:

"A" Noxious Weed	**"B" Noxious Weeds**	**"T" Noxious Weeds**
Woolly distaff thistle	Bull thistle	Gorse
	Canada thistle	Woolly distaff thistle
	Rush skeletonweed	Rush skeletonweed
	Scotch broom	Yellow starthistle

V. Cultural Resources

A review of records did not identify any known prehistoric or historic sites in the immediate vicinity of the following proposed culvert replacements: Bingham Creek culverts 1 and 2, St. John Creek, East Fork St. John Creek, Russell Creek, Suicide Creek, Union Creek, Live Oak Creek, and East Fork Stouts Creek. No cultural or prehistoric sites are documented in the vicinity of proposed in-stream work for that portion of Thompson Creek in Section 3, T. 30 S., R. 7 W., or the tributary of the West Fork Canyon Creek in Section 10, T. 31 S., R 5 W. Areas of proposed road decommissioning, excepting Spur #1 in Section 10, T. 31 S., R. 5 W. were surveyed with negative results. Spur #1 was not surveyed because the steepness of the terrain was considered a limiting factor for potential use.

reas along State Highway 42, and the previously harvested Bolt Cutter timber sale have been identified as potential sources of large wood for in-stream structures. These sites were previously surveyed with negative results.

The site of the proposed Weaver Creek culvert replacement is approximately ¼ mile downstream from a known prehistoric archaeological site, but a survey of the actual project vicinity did not reveal any prehistoric or historic cultural material.

A paleontological site is located along Days Creek , in T. 29 S., R. 3 W., Section 33. Other known prehistoric sites are present in Sections 13, 27, and 33 of T. 29 S., R. 3 W.

Chapter 4
ENVIRONMENTAL CONSEQUENCES

This chapter discusses how the specific resources would or would not be affected in the short term and long term, by implementation of the alternatives contained in this analysis. The discussion also identifies the potential impacts or consequences, and cumulative effects that would be expected.

I. Alternative 1 - Proposed Action

A. Water Resources

Equipment access for installation of culverts and grade control structures could result in a short-term localized increases in sediment to streams, because of stream channel and stream bottom disturbance arising from in-stream operations. Increases would be localized and short-term in nature and would occur during actual installation activities and through the first winter following installation. After the first winter, there would be an overall reduction in sediment inputs from pre-replacement levels as disturbed areas stabilize and revegetate.

The placement of large wood by pulling or felling trees into the active channel of Thompson Creek would aid in the correction of current deficiencies of large wood in the stream channel. Natural recruitment would provide for future replacement of this material as it gradually deteriorates. The large wood placed in the stream channel would help reduce stream energy and re-connect the channel with a larger floodplain. The channel would aggrade as a direct result of physical capture of sediment and substrates by the large wood and associated debris. Additional sediment and substrates would be captured as a consequence of reduced stream velocity. Creation of a larger floodplain would help reduce peak flows downstream and store more water to moderate low flows and elevated water temperatures in summer.

Disturbance of stream banks resulting from tree felling or pulling, and diversion of stream flow into stream banks could also result in increased sediment generation at a localized scope over a period of one to three years, until the stream channel has stabilized and disturbed areas have revegetated. Because of the orientation of the stream and the adjacent topography, no measurable changes in solar radiation are expected that would result in increases in water temperatures.

The anticipated effects of placing in-stream structures in Days Creek and a tributary of West Fork Canyon Creek would be increases in sediment caused by in-stream operations and stream bank disturbance associated with the placement of logs. These effects would be localized and restricted to the immediate sites where equipment accesses the stream, and where log structures are keyed into stream banks. Disturbance of current streamside vegetative would be limited to work sites (see Table 2). Much of the necessary access would be provided by existing skid trails remaining from past tractor harvest entries.

No change in the magnitude or timing of stream flows is expected as a consequence of renovation of the 29-3-33.0 road because the renovation would not involve any large-scale removal of vegetation, increase in road density, or increase in flow routing. A small, short-term increase in sediment would be expected in the first winter following the renovation activities as a result of localized soil disturbance. Erosion and sediment input to Days Creek would be decreased in the long term, compared to present levels, as a consequence of the renovation.

The proposed decommissioning would reduce the drainage network by removing ditchlines and crossdrains that concentrate and redirect runoff, locally. Subsoiling or tilling would increase infiltration of surface water by reducing surface compaction and bulk soil density, which in turn would reduce the rate and volume of sediment delivery from the existing road. The decommissioning of 0.25 miles of road would reduce road density in the drainage by approximately 2 percent, by reducing present road mileage from 12.60 miles to 12.35 miles (Myrtle Creek Watershed Analysis, Appendix A), although the effects of this reduction in road density would not be distinguishable at a fifth-field watershed level, because the change in flow rates and sediment would be localized in the area of the project and would not be measurable at the fifth-field watershed level.

Decommissioning four roads identified in Section 10 of T. 31 S., R. 5 W. would reduce the drainage network by removing ditchlines and crossdrains that concentrate and redirect runoff, locally. Subsoiling or tilling would increase infiltration of surface water by reducing surface compaction and bulk soil density, which in turn would reduce the rate and volume of sediment delivery from the existing roads. The Lower West Fork drainage has a total of 31.17 miles of road in all ownerships (Canyonville/Canyon Creek Watershed Analysis, Table 13, p. 55). The 2.34 miles of road decommissioning would represent an overall reduction of road densities of approximately 0.28 miles per square mile or 7.5 percent of the total mileage in the drainage, although these effects would be indistinguishable at the fifth-field watershed level, because the change in flow rates and sediment would be localized in the area of the project and would not be measurable at the fifth-field watershed level.

B. Special Status, Special Attention and Riparian Associated Species

1. Terrestrial Wildlife

a) Threatened and Endangered

Federally-Threatened Marbled Murrelet

The proposed Thompson Creek tree-lining could affect the species as described under the Endangered Species Act, by the removal of trees that provide suitable nesting habitat. In the event of murrelet occupancy within ¼ mile of the project site, seasonal restrictions on operations would be implemented to remove the possible effects of noise disturbance which could otherwise lead to nest abandonment.

Federally-Threatened Northern Spotted Owl

Thompson Creek

The felling or pulling of 30 or fewer trees along a ¾ mile stretch of Thompson Creek would not affect the function of Critical Habitat Unit OR-62 as dispersal habitat, nor would it affect the distribution of owl pairs, because of the localized scope of the project which would be limited to approximately 10 acres out of 45,572 forested acres managed by the BLM within the Critical Habitat Unit.

The removal of these trees would occur within the 1.3 mile radius home range of two owl pairs, and within the core area of one of those pairs. Removal of as many as 30 trees from within the home range of two spotted owl pairs, and within the 100 acre core area of one of those pairs, could affect the owls as defined under the Endangered Species Act. Removal of the trees could constitute the loss suitable nesting, roosting and foraging habitat. Seasonal restrictions would be implemented if owls are nesting, to eliminate the possibility of nest abandonment as a consequence of noise disturbance.

Days Creek

The in-stream structure placement could involve pulling or felling of up to 40 trees which represent suitable nesting and roosting habitat for owls. None of these trees would be located within a ¼ mile of any core area. The loss of these trees as habitat would not likely affect owls because of the dispersed nature of tree removal and the location outside of established core areas. The removal would be consistent with minor natural disturbances to the forest canopy, such as the random blow down of individual trees. Access for mechanical placement of additional structures would affect an estimated 9 acres of vegetation within Riparian Reserves. Timber stands in these areas are typically 30-to-50 years of age, and represent dispersal habitat. The modification or removal of 9 acres out of the estimated 2,500 acres of riparian dispersal habitat in the Days Creek subwatershed would have no measurable effect on available dispersal habitat because of the small amount of the overall area that would be affected. The removal of blown down trees along side of roads, for use as in-stream structures would not affect owls because they are not considered to represent usable habitat for owls. Noise disturbance would not affect owls because if they are found to be nesting outside of their traditional locations, and within ¼ mile of project sites, seasonal restrictions would be imposed to remove the potential for noise disturbance that could otherwise result in nest abandonment.

The proposed stream bank stabilization, road renovation and culvert replacement would not remove any suitable habitat. Noise disturbance is not considered likely because of the distance from project areas to core areas, and the general lack of suitable habitat in the immediate proximity of project sites.

Weaver Creek

The culvert site is within a ¼ mile of an owl core area. No suitable habitat would be removed. Noise disturbance would not be likely because of the distance of the site from the core area, and the absence of suitable habitat in the immediate project vicinity.

Road No. 29-4-23.1

There would be no affect on any suitable habitat because no trees would be removed that constitute suitable nesting, foraging and roosting habitat. Noise disturbance would not affect owls because if they are found to be nesting outside of their traditional locations, and within ¼ mile of the project site, seasonal restrictions would be imposed to remove the potential for noise disturbance that could otherwise result in nest abandonment.

b) Bureau Sensitive

Of the ten species identified, management direction currently exists for only the northern goshawk, the Del Norte salamander, and the Oregon Megomphix snail.

The northern goshawk would not be affected by the proposed actions. If nesting birds are present, nest groves would be protected in accordance with management direction (ROD/RMP, p. 49) and seasonal restrictions on operations within ¼ mile of nesting birds would be imposed to avoid disturbance during the nesting period. The dispersed felling or pulling of trees for in-stream structure would not reduce foraging habitat or opportunities, because of the localized nature of the action.

The Del Norte salamanader and the Oregon Megomphix snail are also listed as Survey and Manage species. Surveys of suitable habitat would be conducted and current management direction would be applied to known sites. No effects on these species are anticipated because management direction for protection of known sites would protect the habitat features and microclimate conditions necessary to these species (FSEIS, 1994. PRMP/EIS, 1994. pp. 4-50 & 51).

c) Bureau Assessment

Merlins would be unaffected by the proposed actions. If nesting birds are present, nest groves would be protected in accordance with management direction. The dispersed felling or pulling of trees for in-stream structure would not reduce foraging habitat or opportunities, because of the localized nature of the action.

d) SEIS Special Attention Species (Survey and Manage, Protection Buffer)

There would be no direct or indirect impacts to any of the wildlife species identified in the Affected Environment discussion of this analysis, which are listed as Protection Buffer or Survey and Manage species, because prior to implementation of any of the individual actions, protocol surveys would be conducted where suitable habitat is present on BLM-managed lands. If species are located during surveys, the sites would be managed in accordance with the current management direction. This management direction would protect habitat and micro-climate conditions essential to the persistence of the species. (FSEIS, 1994; PRMP/EIS,1994. pp. 4-50 and 4-51)

2. Fish

Culvert replacement and placement of grade control structures would accomplished in the summer during periods of low flow, which would restrict the potential generation of sediment and limit the effects to the project site. This would result in localized, short-term affects on aquatic habitat that would be anticipated to last from 1-to-3 years. There would be direct disturbance of stream channels and riparian vegetation resulting in an increase in the mobilization of sediments. Culvert replacement would directly improve habitat for anadromous and resident fish, and other aquatic species by reducing sediment levels in the long term, reducing stream velocities, and allowing passage to additional reaches of habitat. Grade controls would create step-pool habitat which would provide cover for aquatic species and capture sediments.

The pulling or felling trees into Thompson Creek and should have no affect on stream temperature because of the dispersed nature of the canopy removal and the geographic orientation of the stream. There would be a localized, short-term increases in sediment expected to last 1-to-3 years resulting from bank disturbance associated with tree placement and diversion of stream flow. The structures provided by the trees would improve habitat for fish and other aquatic wildlife by creating pools for habitat, reservoirs of cold water, and a reduction in sediments as they are trapped behind logs. The logs would also serve to trap substrates, providing for additional spawning beds, create meander of the stream channel which would reduce stream velocities, provide organic nutrients, and lead to development of a floodplain.

Placement of in-stream structures in Days Creek and a tributary of the West Fork Canyon Creek would result in a localized, short-term increases in sediment expected to last 1-to-3 years resulting from bank disturbance associated with tree placement and diversion of stream flow. The structures provided by the trees would improve habitat for fish and other aquatic wildlife by creating pools for habitat, reservoirs of cold water, and a reduction in sediments as they are trapped behind logs. The logs would also serve to trap substrates, providing for additional spawning beds, create meander of the stream channel which would reduce stream velocities, provide organic nutrients, and lead to development of a floodplain.

Road decommissioning would result in localized, short-term increases in sediment associated with tilling of road surfaces and removal of stream crossings. The effects would last 1-to-3 years, until streams have reestablished their historical channels, and exposed road surfaces have been revegetated. As described on page 22 of this document, removal of the roads would reduce road densities in the affected drainages resulting in reduced sediment delivery. Removal of stream crossings on these roads would reestablish direct connection of stream reaches and habitat within the affected streams.

Road renovation would result in localized, short-term increases in sediments associated with installation of additional cross-drains and relief culverts, pull-back of unstable fills, and replacement of existing culverts. Elevated sediment levels would not persist past the first winter

following renovation, after which revegetation would stabilize exposed sites. In the long term, there would be reductions in sediment from present levels. Present levels of high-flow events would be reduced as a consequences of improved drainage systems that do not concentrate runoff into a few areas, but instead allow for greater dispersal and infiltration.

There would be a localized, short-term increase in sediments from stream bank stabilization on Days Creek, associated with the placement of in-stream structures. In the long term there would be a reduction in sediments from present levels, as the eroding bank is stabilized and revegetated.

As described under the Endangered Species Act, the proposed actions may affect the Oregon Coast coho salmon as a consequence of input of sediment into streams, disturbance of spawning gravels (substrates), and current stream channel and habitat features which may affect fish behavior, feeding, and spawning.

3. Plants

Surveys of potential habitat for vascular plants species listed as threatened or endangered would be conducted on all project sites prior to implementation of individual components of the proposed action. Surveys of potential habitat for special attention species of vascular and non-vascular plants would be conducted on BLM-administered lands prior to implementation of individual components of the proposed action. Occupied sites identified in surveys would be protected in accordance with management direction. As a consequence, there would be no direct impacts to these plant species anticipated in the short term, as a consequence of implementation of the projects comprising the proposed action (FSEIS, 1994., PRMP/EIS, 1994, pp. 4-50 & 51).

4. Riparian Associated Species

Given the small size of areas that would be disturbed, the dispersal of these areas, the general lack of late-successional habitat in the project areas, and the negligible number of acres (see Table 2) that would be affected when compared to the total acreage of Riparian Reserves in the affected watersheds, the proposed actions are expected to have a neutral effect on riparian associated in the short term. In the long term, effects of the restoration projects that include enhanced habitat complexity, restoration of spatial connectivity within and between aquatic systems, and improved water quality from reductions in sediments should benefit these species.

C. Soils

The only soils for which there are any concerns are those formed from granitic or mica schist parent material, such as are found on the Weaver Creek, Days Creek, East Fork Stouts Creek, and St. John Creek sites, and along the portion of the 29-4-23.1 road proposed for decommissioning.

The soils at these sites are more susceptible to surface erosion and may have a higher probability of slope failure. Granitic soils also have a lower organic carbon content than other soils and are less resilient when disturbed. Revegetation of these areas immediately following completion of work would reduce the potential for erosion and loss of soil productivity.

The proposed culvert replacements on Weaver Creek, Days Creek, East Fork Stouts Creek, St. John Creek and East Fork St. John Creek would reduce erosion attributable to existing culverts through proper installation of new culverts and the incorporation of in-stream grade structures that would reduce the potential for downcutting, and reduce stream velocities that erode stream banks and channels. Renovation of the 29-3-33.0 road would reduce the potential for slope failures by dewatering saturated slopes, revegetating exposed fill and cut slopes, and would also reduce surface erosion that is a source of sediment. It would also correct drainage problems and resurface portions of the road that are currentlty subject to surface erosion.

D. Noxious Weeds

The BLM has a strategic plan for dealing with Noxious Weeds addressed in the Roseburg District *Integrated Weed Control Plan* and Environmental Assessment (USDI, Roseburg District, 1995). This environmental assessment is tiered to the *Northwest Area Noxious Weed Control Program Environmental Impact Statement* (USDI, Bureau of Land Management, Washington Office, Washington, D.C. 1985) and *The Supplemental Record of Decision for the Northwest Area Noxious Weed Control Program* (USDI, Bureau of Land Management, Washington Office, Washington, D.C. 1987).

There would be no anticipated impacts to populations of non-native and noxious weeds. Implementation of the *Integrated Weed Control Plan* by the District would continue in an effort to prevent or reduce rates of spread of weed populations.

E. Cultural Resources

The proposed action would have no direct effect on cultural resources because areas proposed for restoration projects would be inventoried for cultural resources in a site-specific project analysis. All potentially ground-disturbing activities would be conducted in a manner that complies with the National Historic Preservation Act (NHPA) and implementing regulations (36CFR800); the National Cultural Programmatic Agreement between the BLM, the National Conference of State Historic Preservation Offices (SHPO), and the Advisory Council on Historic Preservation; and Oregon state cultural protocol. In accordance with policy and law, if cultural resources are found in a specific project area, the project would be redesigned to avoid the cultural resources, or dropped from further consideration based on recommendations from the District Archaeologist

There would be no consequence of the proposed actions on the following sites because there are no cultural, historic, or prehistoric resources present, as determined by previous surveys:

Bingham Creek culverts, St. John Creek culvert, E. Fork St. John Creek culvert, Russell Creek culvert, Suicide Creek culvert, Union Creek culvert, Live Oak Creek culvert, E. Fork Stouts

Creek culvert, Thompson Creek tree-lining, Weaver Creek culvert, W. Fork Canyon Creek in-stream structure placement and road decommissioning, decommissioing of a portion of Road No. 29-4-23.1.

Areas identified as potential sources for large wood to be used for in-stream in the previously harvested Bolt Cutter timber sale were surveyed with negative results. Removal of the trees that have been already felled to accommodate slide repairs on Highway 42 was previously evaluated and would have no effect on any prehistoric or historic sites.

In sections 13, 23, 27, and 33 of T. 29 S., R. 3 W., pedestrian surveys for the presence of any historic, prehistoric, or paleontological sites would be conducted in the summer of 2000. There are prehistoric sites in Sections 13, 27, and 33 of T. 29 S., R.3 W. already identified. Test probes of the prehistoric sites in Sections 13 and 27 would be conducted to determine whether sufficient cultural material exists to require formal archaeological evaluations. Field review prior to ground disturbance would be conducted prior to the proposed removal of any blown down timber along the 29-3-33.0 road. Any new sites identified would be evaluated and if warranted, consulted with SHPO.

II. Alternative 2 - No Action

A. Water Resources

There would be no replacement of the culverts identified as at-risk by District and Field Office engineering personnel. The culverts are deteriorating and are of inadequate size to pass theoretical100-year flood events, posing a high risk of failure during periods of high flow or extreme flooding (Chapter 3, p. 10). Bankfull channel width would continue to be constricted to the narrow channels created by the culverts, resulting in high stream velocities at the outlets. These higher stream velocities would continue downcutting of the channels below the outlets, resulting in continued erosion of streambeds and banks. The culverts would continue to be a chronic source of sediment during high flows and failure could lead to a large sediment input.

The proposed tree-lining on Thompson Creek would not occur. Streambed scouring and transport of substrates would continue during periods of high flow until tree mortality in provides for the natural recruitment of sufficient large wood to reduce stream velocity and dissipate stream energy. It is anticipated that it could take from 25-50 years before natural mortality in the adjacent stands would provide the necessary levels of large wood. Stream velocities would remain high during periods of peak flow resulting in high levels of sediment delivery as downcutting of the stream channel and erosion of banks continues. Lacking meander, created in part by obstructions in the channel, there would be no floodplain development. Sediments would not be captured in the active channel or by riparian vegetation in the floodplain. A lack of floodplain development would not provide for an increased capacity for water storage within the riparian area which could otherwise serve to moderate low summer flows and higher stream temperatures. Consequently this stream reach would continue to be water quality limited for sediment, temperature, and habitat modification.

The proposed placement of in-stream structures in Days Creek and the tributary to the West Fork Canyon Creek would not occur. Stream velocities would remain high during periods of peak flow resulting in high levels of sediment delivery as downcutting of the stream channel and erosion of banks continues. Lacking meander, created in part by obstructions in the channel, there would be no floodplain development. Sediments would not be captured in the active channel or by riparian vegetation in the floodplain. A lack of floodplain development would not provide for an increased capacity for water storage within the riparian area which could otherwise serve to moderate low summer flows and higher stream temperatures. Because the present age of most of the timbered stands along Days Creek, it is unlikely that sufficient large wood would be available for recruitment for 75-100 years. The Riparian Reserves on the tributary to the West Fork Canyon Creek are almost void of conifers. Replanting of the Riparian Reserve with conifers would not occur.

The proposed bank stabilization on Days Creek would not occur and the bank would continue to erode until a dynamic equilibrium related to channel sinuosity is reached, or until an event such as the natural recruitment of large wood deflects stream flow away from the base of the slope. The slope would not be pulled back and revegetated, posing a continued risk for erosion and mass wasting, as well as a major source of sediment to Days Creek .

The 29-3-33.0 road would not be renovated. Present drainage problems resulting from inadequately sized relief culverts and tributary crossings would continue to divert flow onto road surfaces, restrict stream channels, accelerate stream velocities and increase sediment delivery to streams.

The lower portion of the 29-4-23.1 road would not be renovated, and the upper portion would not be decommissioned. The upper portion of the road would continue to restrict normal infiltration, route flow directly into streams, restrict tributary channels resulting in accelerated stream velocities and increase sediment delivery to streams and to South Myrtle Creek. The four roads in the West Fork Canyon Creek would not be decommissioned. These roads would continue to pose water quality problems consistent with those caused by the 29-4-23.1 road.

B. Special Status, Special Attention and Riparian Associated Species

1. Terrestrial Wildlife

There would be no direct effects to marbled murrelets or northern spotted owls as a consequence of the no action alternative because current habitat conditions would not be altered and no disturbance associated with restoration activities would occur, nor would there be any direct effects to any other special status wildlife listed as a Bureau Sensitive or Bureau Assessment species for the same reasons.

There would be no disturbance or removal of vegetation that would have an immediate effect on habitat for Survey and Manage, or Protection Buffer species. The cumulative effects of degraded watershed conditions would affect those species that depend on riparian and aquatic habitats for all or a portion of their life-cycle requirements. There could be direct effects on these species in the event of a future catastrophic culvert failure that would remove vegetation, erode soils, destroy in-stream habitat structure, and further degrade riparian and aquatic habitats.

2. Fish

No in-stream work, culvert replacement, bank stabilization, road decommissioning, or road renovation would be implemented which would improve water quality by reducing sediment, moderating high water temperatures, and moderating flow levels. There would be no placement of in-stream structures which would provide additional spawning and rearing habitat for fish and provide habitat for aquatic prey species upon which fish feed. The maintenance of current habitat deficiencies and improperly functioning aquatic processes would be inconsistent with the objective of reducing sediment to improve water quality, identified in the *Purpose and Need for Action* in Chapter 1 of this document, and watershed restoration objectives contained in the Roseburg District ROD/RMP. Cumulative impacts associated with sediment, stream velocities and a lack of complex habitat features would persist. Future habitat conditions would be further degraded in the long term as a result of these impaired or improperly functioning aquatic processes related to BLM culverts and roads which are presently degrading water quality and riparian habitat conditions.

3. Plants

There would be no direct impacts to any special status vascular plant species, or any direct impacts to SEIS Special Attention species of vascular and non-vascular plants because the alternative would not involve or constitute the disturbance or modification of present or potential habitat for these species. Indirect and cumulative effects from erosion and sediment related to BLM roads and culverts could degrade future riparian and aquatic habitat conditions.

4. Riparian Associated Species

There would be no actions implemented which would improve water quality, reduce sediment, reconnect riparian habitats, or provide additional habitat opportunities for aquatic wildlife. Cumulative impacts associated with sediment, stream velocities, and a lack of complex habitat features would persist. Future habitat conditions could be further degraded in the long term as a direct result of these impaired or improperly functioning aquatic processes that are a result of BLM roads and culverts which are presently contributing sediment to aquatic systems and degrading water quality and riparian habitat conditions.

C. Soils

None of the proposed culvert replacements, tree-lining, in-stream structure placement, stream bank stabilization, road decommissioning or road improvement projects would be undertaken.

There would be no direct impacts to soil resources in the absence of any ground/soil disturbing or displacing activities.

Cumulative impacts to soils would continue. Current conditions that are contributing to erosional processes and loss of soil productivity would not be corrected. Undersized or improperly installed culverts would continue to erode stream channels and banks, and in the event of a catastrophic failure could result in a large-scale loss of soil. Insufficient numbers of cross-drains and relief culverts would continue to divert runoff over road surfaces causing sheeting and surface erosion. Unstable and exposed fill and cut slopes would be subject to erosion and would pose a continuing risk of slope failure. Roads identified for decommissioning would remain as a source of sediment and an impediment to normal infiltration of precipitation. Eroding stream banks would continue to deliver large amounts of sediment into waterways.

D. Noxious Weeds

The BLM has a strategic plan for dealing with Noxious Weeds addressed in the Roseburg District *Integrated Weed Control Plan* and Environmental Assessment (USDI, Roseburg District, 1995). This environmental assessment is tiered to the *Northwest Area Noxious Weed Control Program Environmental Impact Statement* (USDI, Bureau of Land Management, Washington Office, Washington, D.C. 1985) and *The Supplemental Record of Decision for the Northwest Area Noxious Weed Control Program* (USDI, Bureau of Land Management, Washington Office, Washington, D.C. 1987).

There would be no anticipated impacts to populations of non-native and noxious weeds. Implementation of the *Integrated Weed Control Plan* by the District would continue in an effort to prevent or reduce rates of spread of weed populations.

E. Cultural Resources

There would be no activities of a ground disturbing nature. As a consequence, no direct effects to known or suspected sites of cultural value would be expected. There could potentially be indirect impacts to cultural sites along streams and on floodplains in the event of catastrophic failure of a large culvert resulting in subsequent flooding and debris torrents.

III. Monitoring

Monitoring would be done in accordance with the ROD/RMP, Appendix I (pp. 190-191, & 195-199).

Chapter 5
LIST OF PREPARERS, AND AGENCIES AND INDIVIDUALS CONTACTED OR CONSULTED, AND LITERATURE CITED

This project was included in the Roseburg BLM Project Planning Update (Spring 2000). The notice of decision will be published in the News Review if a decision is made to implement the project.

I. Agencies & Persons Contacted:

Adjacent Landowners
Coquille Indian Tribe
Cow Creek Band of Umpqua Indians
National Marine Fisheries Service
Registered Downstream Water Users
Oregon Department of Environmental Quality
Oregon State Division of Lands
Oregon State Historic Preservation Office
U.S. Fish and Wildlife Service

II. The following agencies, organizations, and individuals will be notified of the completion of the EA/FONSI:

National Marine Fisheries Service
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Oregon Division of State Lands
Ronald S. Yockim
U.S. Fish and Wildlife Service

III. List of Participants/Preparers:

Rob Hurt	Fisheries Biologist	Project Lead/Fisheries
Paul Ausbeck	NEPA Coordinator	EA Writer
Gary Basham	Botanist	Special Status Plants
Sandy Bigler	Natural Resources Technician	Engineering
Nancy Duncan	Wildlife Biologist	Wildlife/T&E Species
Dennis Hutchison	Soil Scientist	Soils
Ed Richardson	Supervisory Engineering Tech.	Management Representative
Don Scheleen	Archaeologist	Cultural Resources
Rick Shockey	District Engineer	Engineering
Larry Standley	Hydrologist	Water Resources

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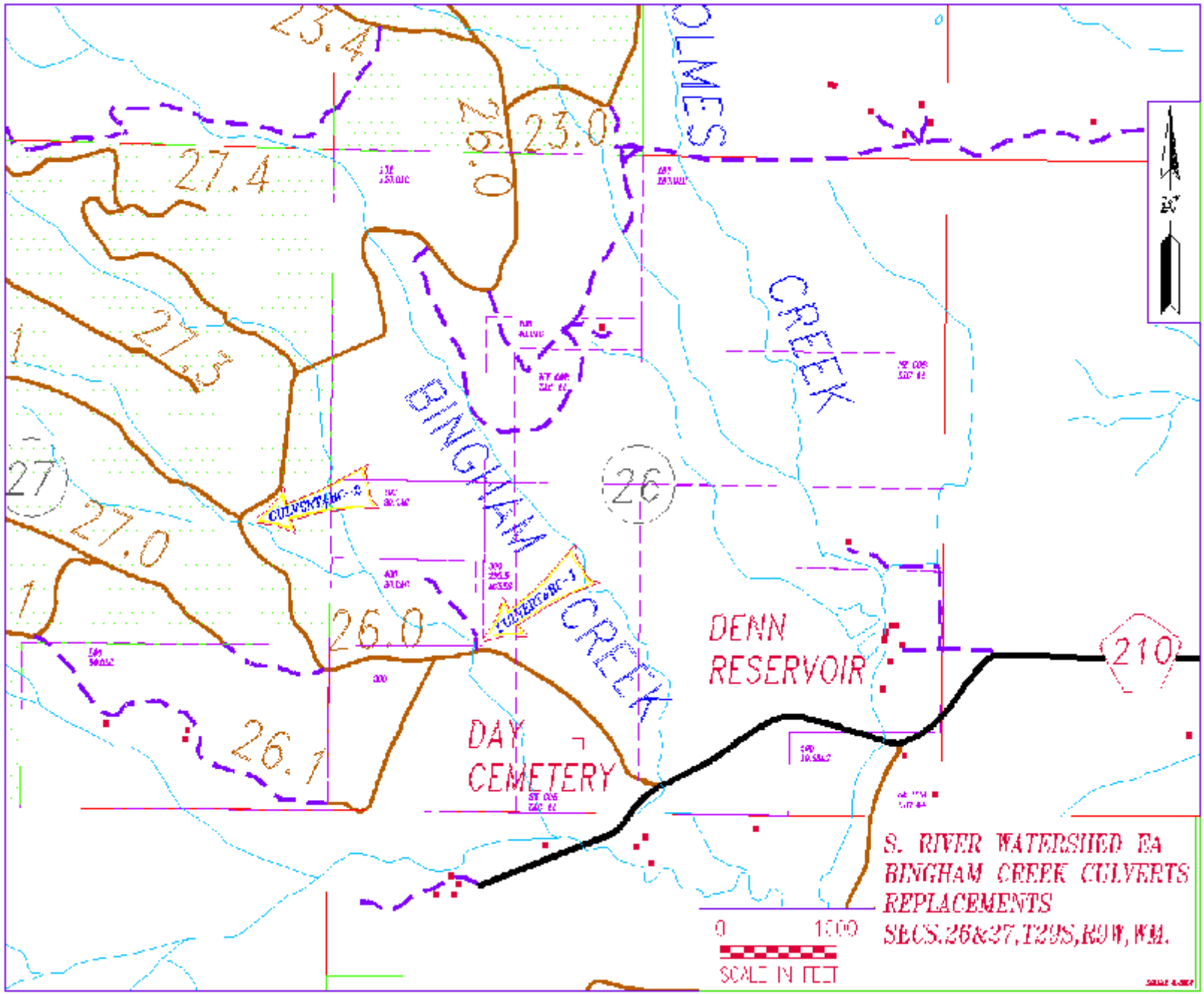
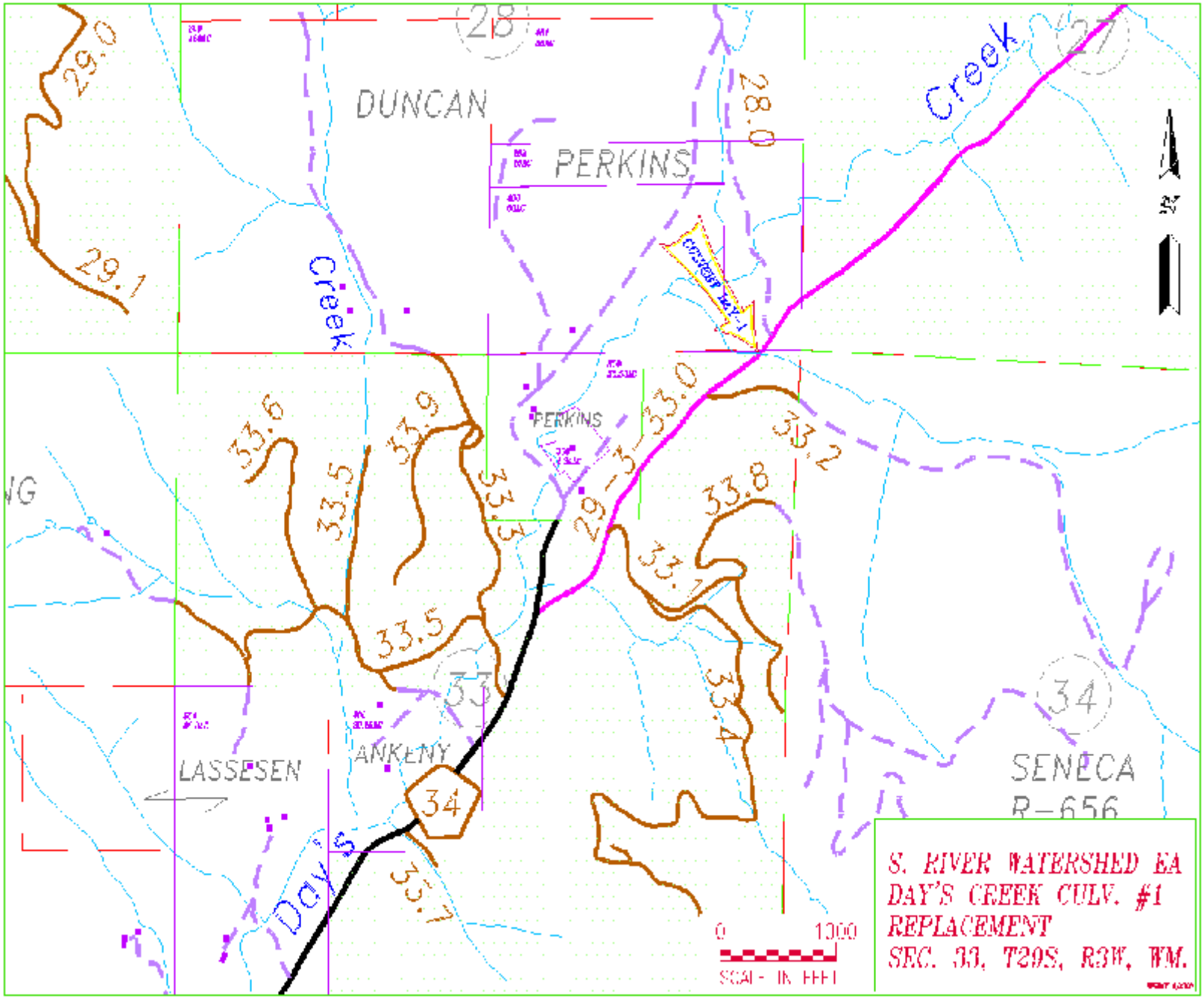
APPENDIX A

PROJECT AREA

MAPS


23.4
23.0
27.4
27.3
27
27.0
26
26.0
26.1
OLMES
CREEK
BINGHAM
CREEK
DENN
RESERVOIR
DAY
CEMETERY
210
0
1500
SCALE IN FEET
S. RIVER WATERSHED EA
BINGHAM CREEK CULVERTS
REPLACEMENTS
SECS.26&27,T29S,R3W,WM.


DUNCAN
PERKINS
LASSESEN
ANKENY
SENECA
R-656
Creek
Day's
29.0
29.1
28.0
33.6
33.5
33.9
33.3
33.0
33.2
33.8
33.7
33.4
33.5
33.7
34
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SCALE - IN FEET
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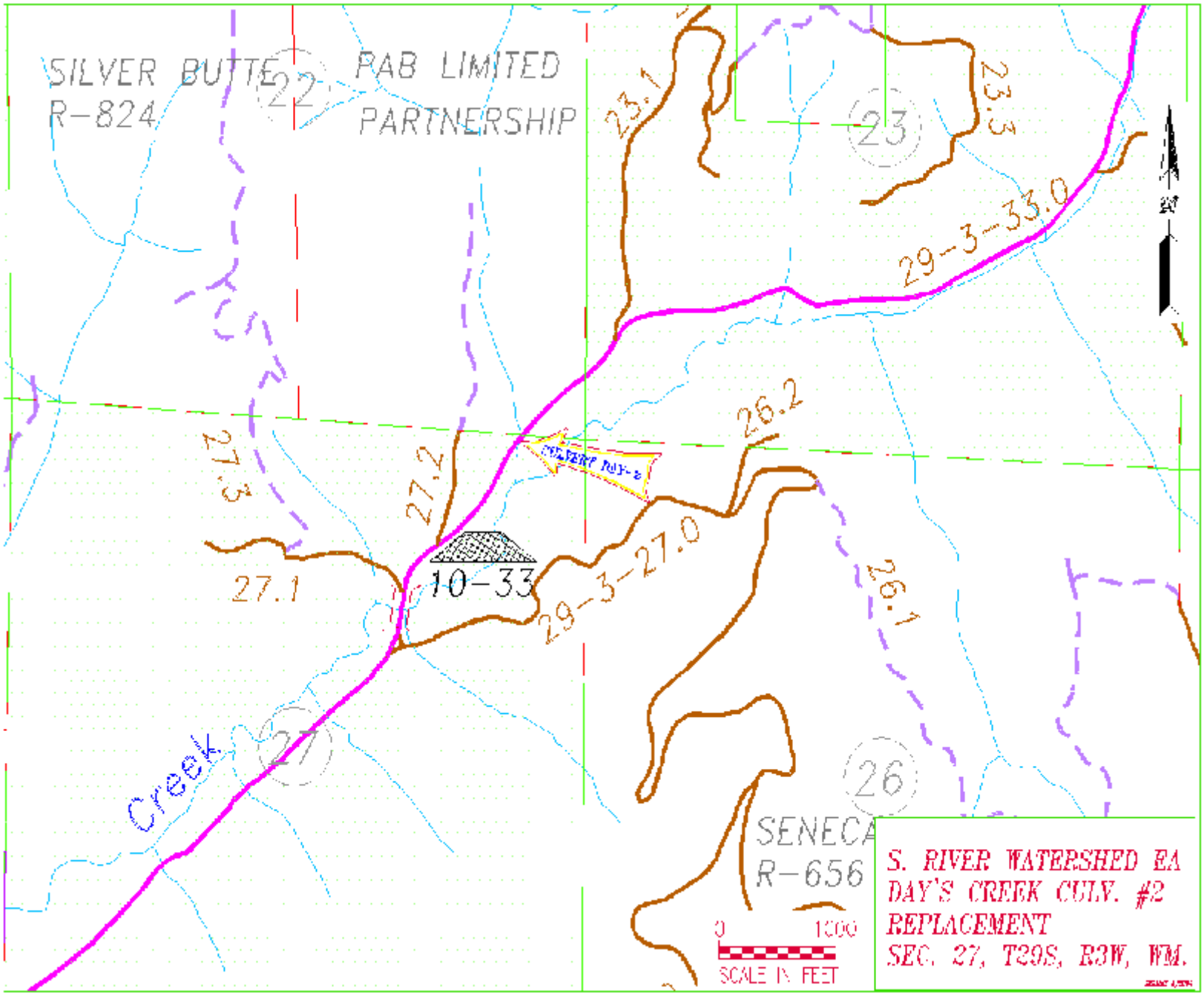
DAY'S CREEK CULV. #1
REPLACEMENT
SEC. 33, T29S, R3W, WM.


SILVER BUTTE
R-824
22
PAB LIMITED
PARTNERSHIP
23.1
23
23.3
29-3-33.0
26.2
27.3
27.2
27.1
10-33
29-3-27.0
26.1
Creek
27
26
SENECA
R-656
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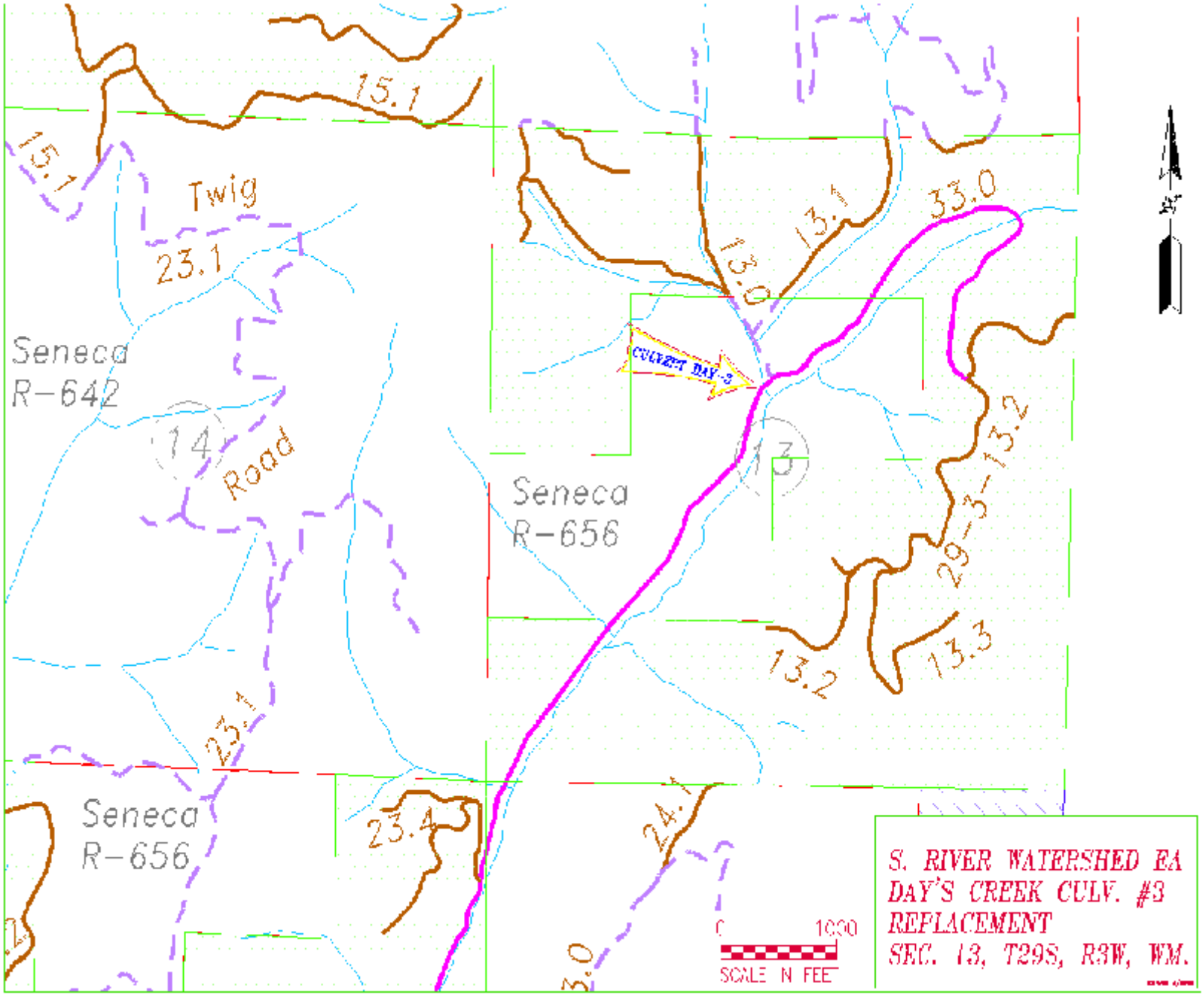
15.1
15.1
Twig
23.1
Seneca
R-642
14
Road
13.0
13.1
33.0
CULVERT DAY-3
13
Seneca
R-656
29-3-13.2
13.2
13.3
23.1
Seneca
R-656
23.4
24.1
3.0
0
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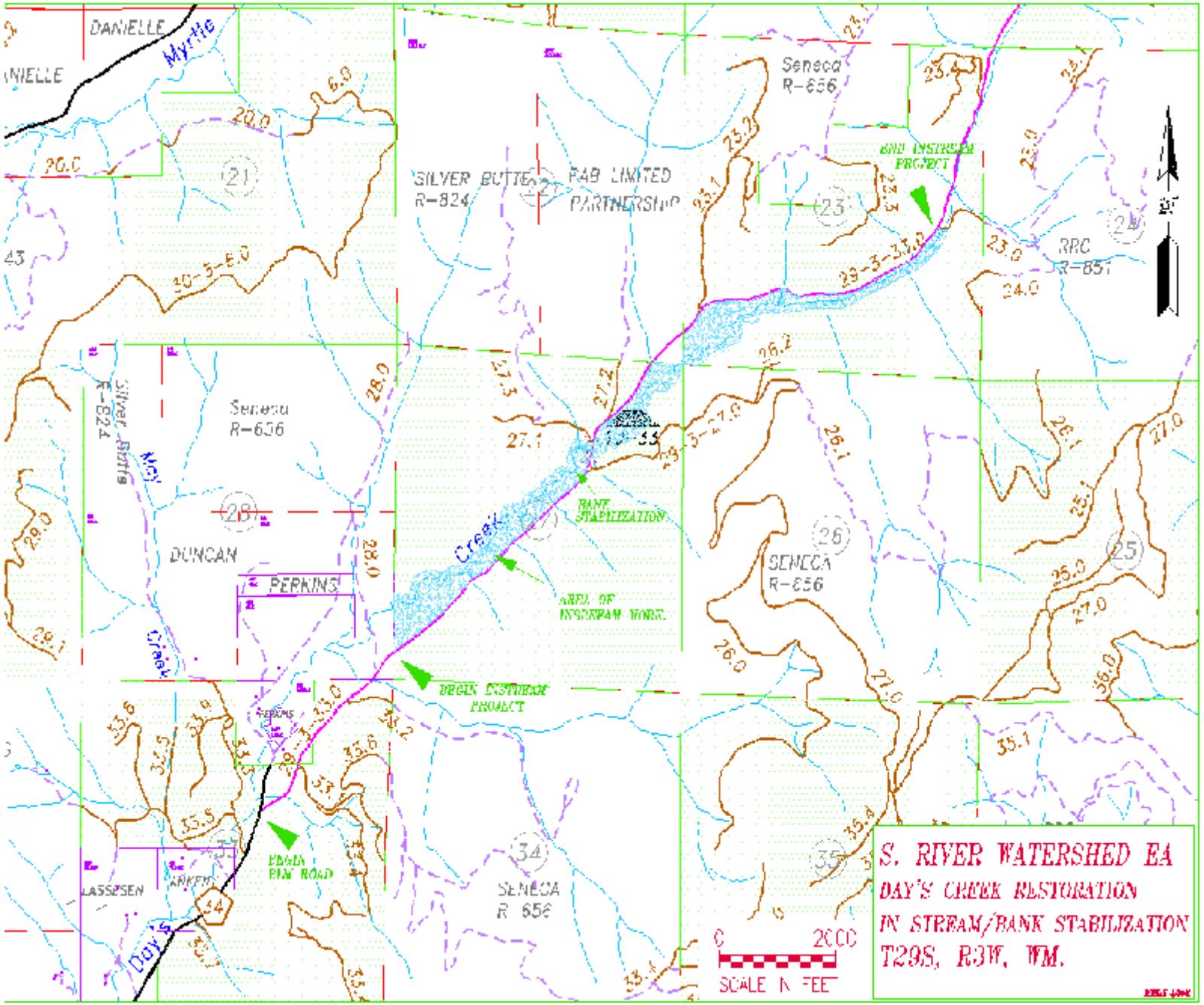
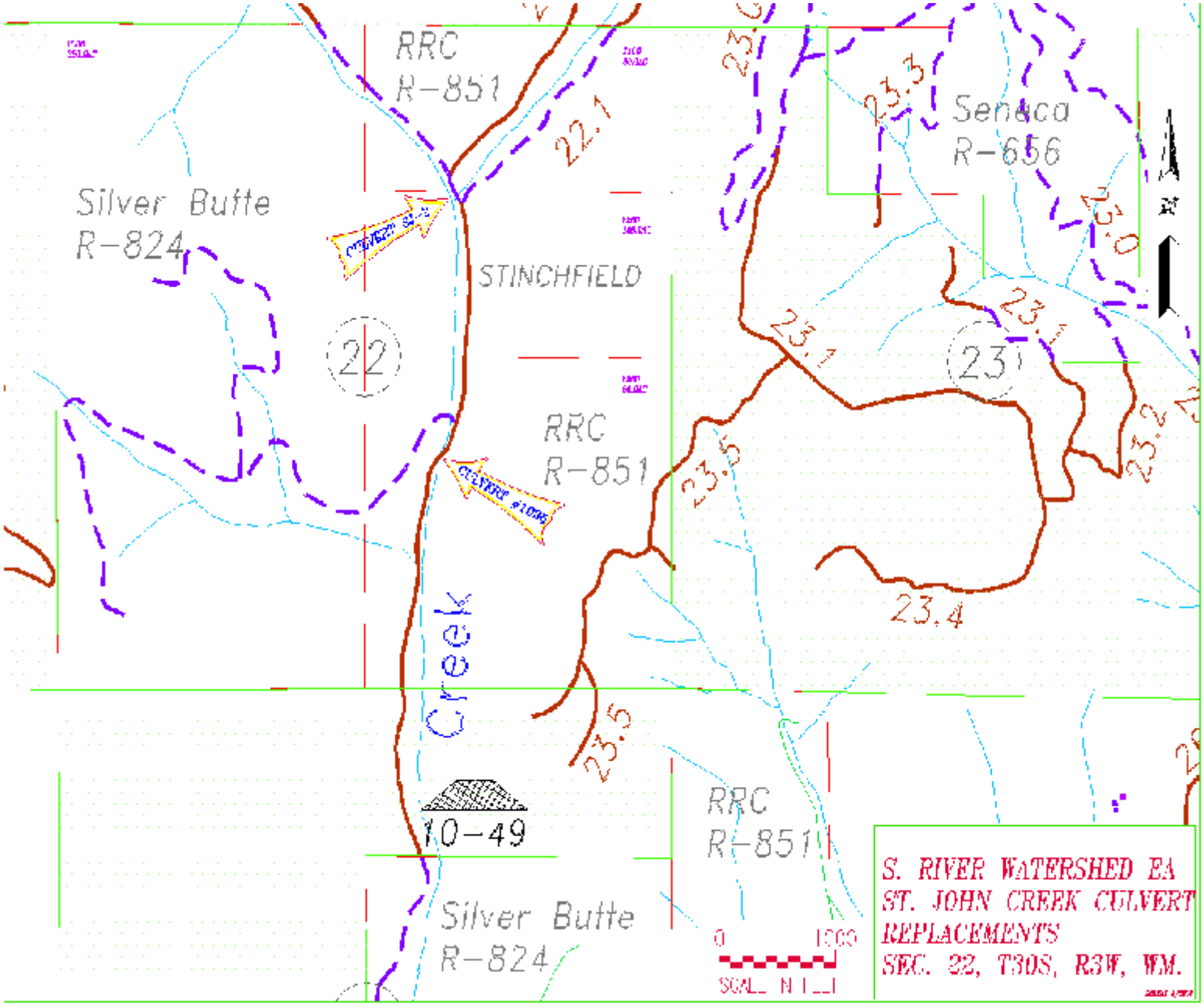
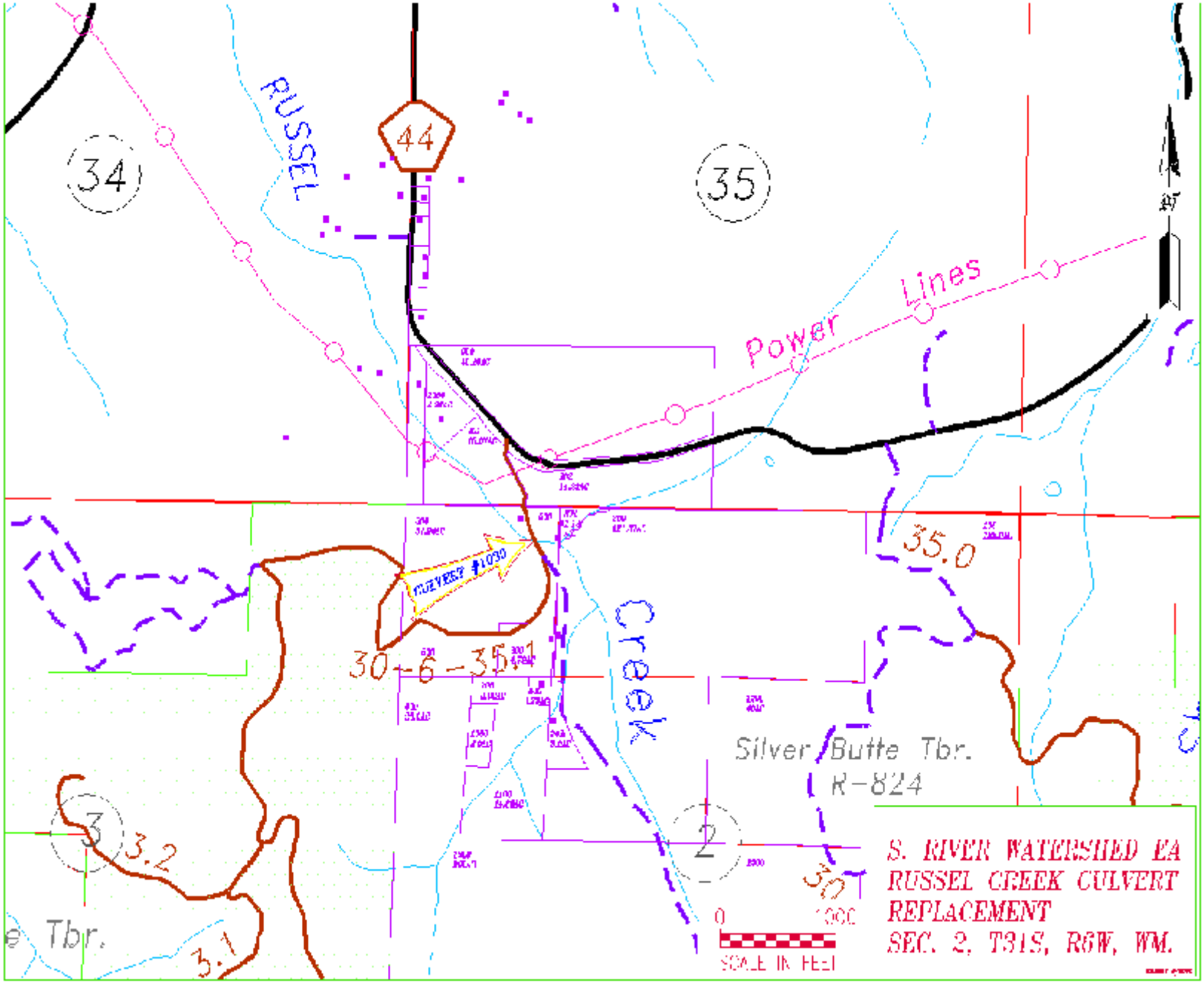

DANIELLE
Myrtle
Seneca
R-656
SILVER BUTTE
R-824
RAB LIMITED
PARTNERSHIP
END INSTREAM
PROJECT
RRC
R-851
Seneca
R-656
DUNCAN
PERKINS
Creek
BANK
STABILIZATION
AREA OF
INSTREAM WORK
SENECA
R-656
BEGIN INSTREAM
PROJECT
EAGLE
ROCK ROAD
SENECA
R 656
LASSESEN
Day's
2000
SCALE IN FEET
S. RIVER WATERSHED EA
DAY'S CREEK RESTORATION
IN STREAM/BANK STABILIZATION
T29S, R3W, WM.


RRC
R-851
Silver Butte
R-824
STINCHFIELD
22
RRC
R-851
Creek
10-49
Silver Butte
R-824
RRC
R-851
Seneca
R-656
23
22.1
23.3
23.0
23.1
23.2
23.5
23.4
23.5
S. RIVER WATERSHED EA
ST. JOHN CREEK CULVERT
REPLACEMENTS
SEC. 22, T30S, R3W, WM.


RUSSEL
44
34
35
Power Lines
CULVERT #1030
30-6-35
35.0
Creek
Silver Butte Tbr.
R-824
3
3.2
3.1
Tbr.
2
30
0
SCALE IN FEET
S. RIVER WATERSHED EA
RUSSEL CREEK CULVERT
REPLACEMENT
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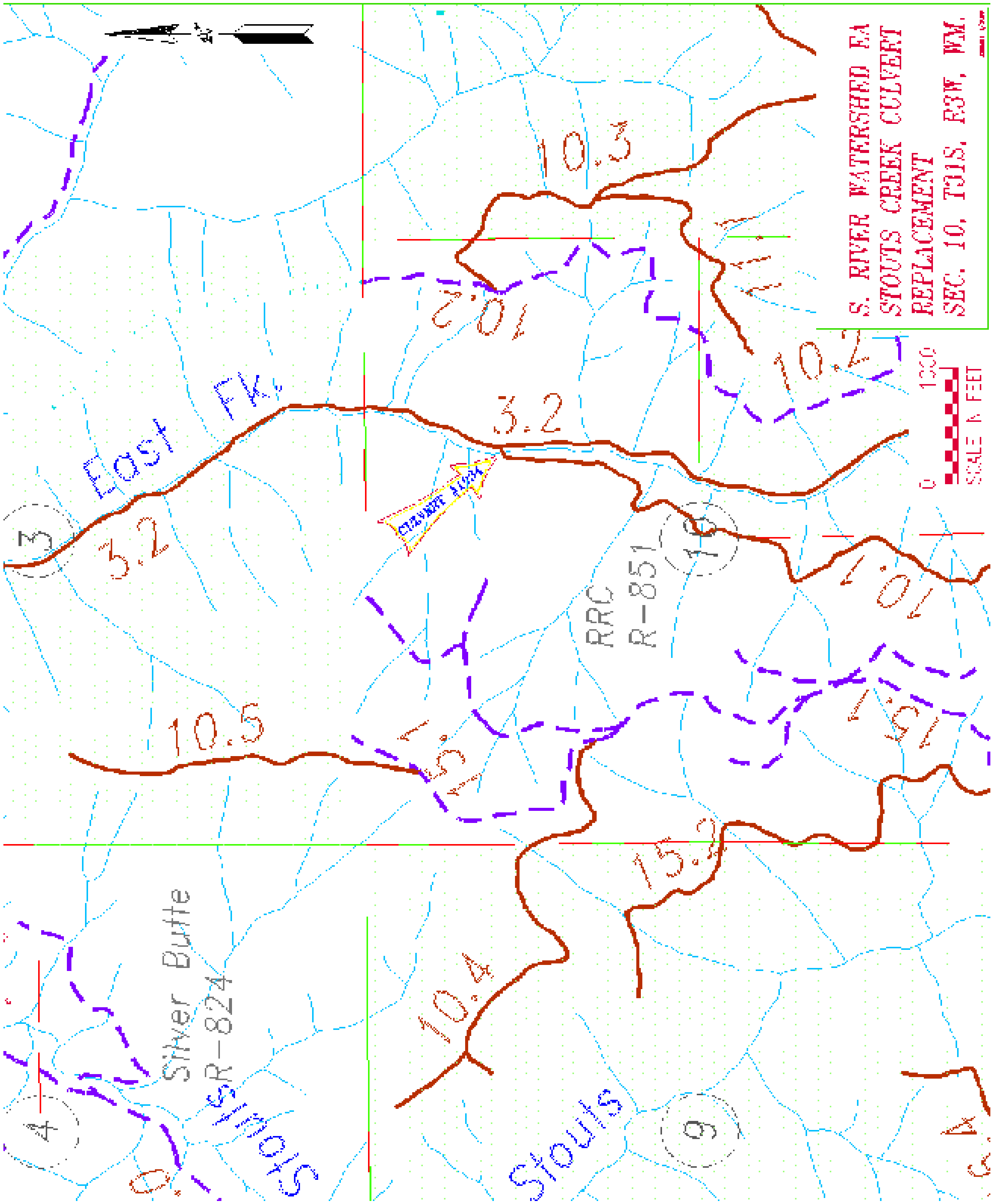
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SEC. 10, T31S, R3W, W.M.
0
1320
SCALE IN FEET
East Fk.
Stouts
Silver Butte
SR-824
RRC
R-851
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10.5
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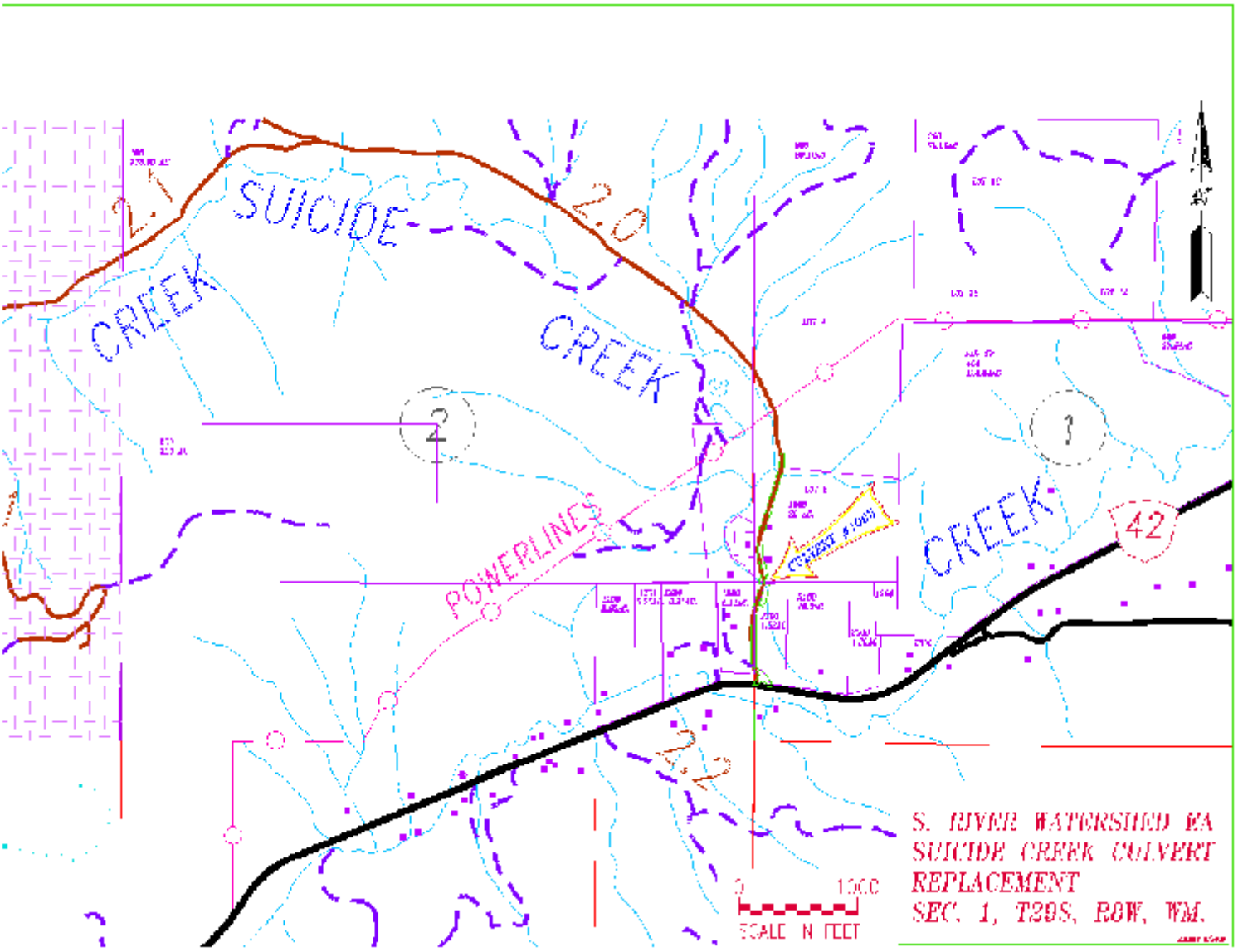
10


SUICIDE
CREEK
CREEK
CREEK
POWERLINES
42
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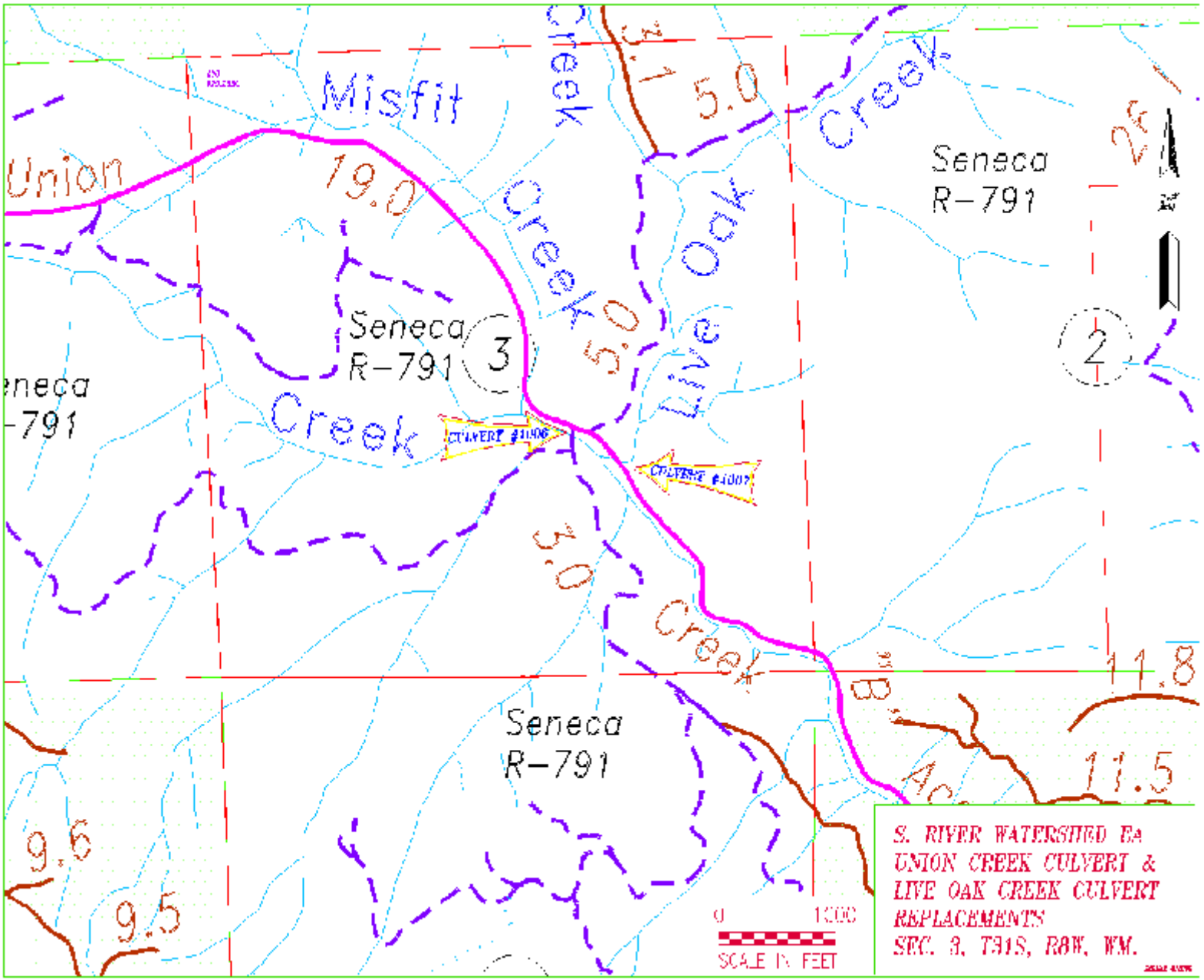
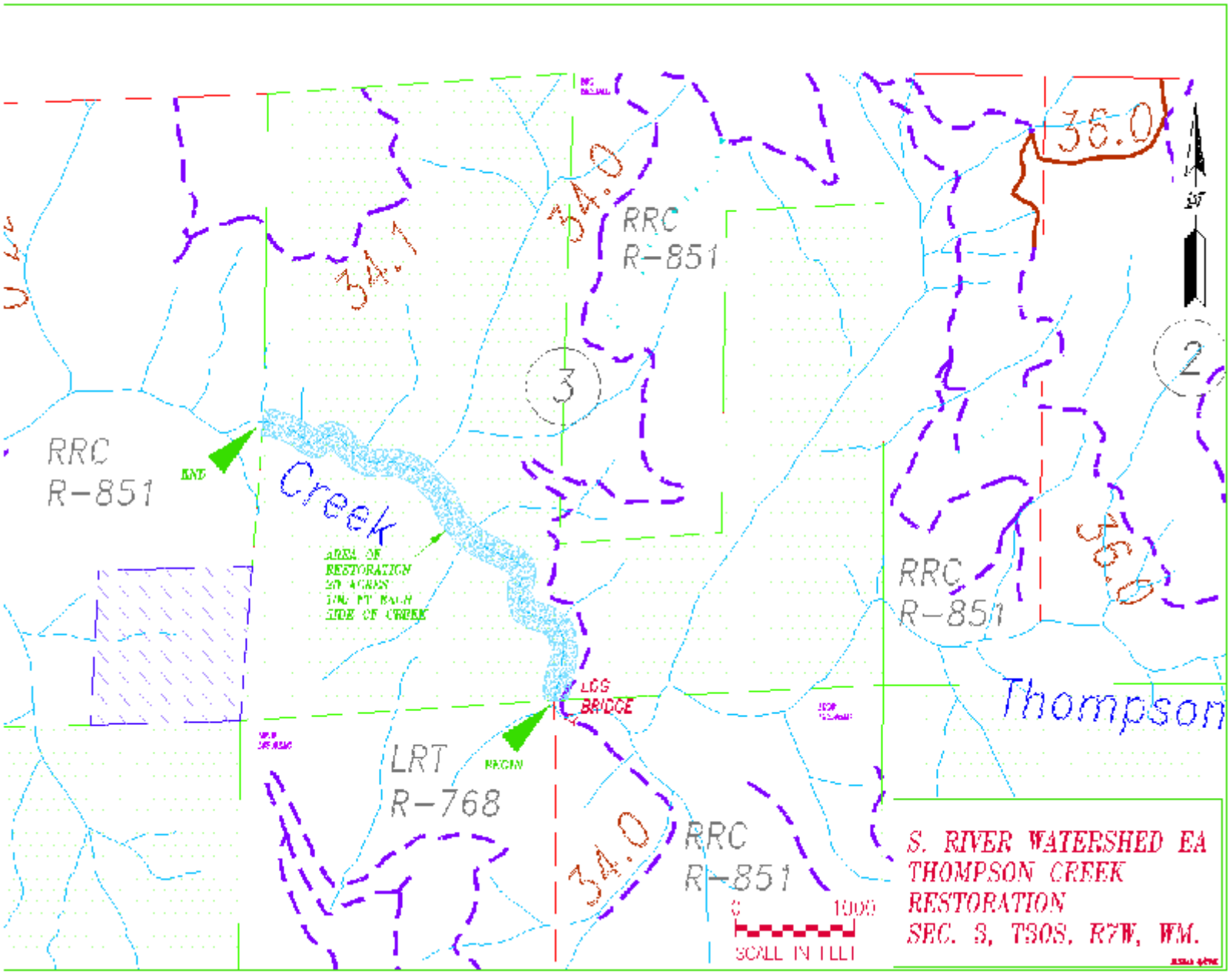
SUICIDE CREEK CULVERT
REPLACEMENT
SEC. 1, T29S, R8W, WM.
SCALE IN FEET


Misfit
Union
Creek
Seneca
R-791
3
Creek
5.0
Live Oak
Creek
Seneca
R-791
2
19.0
3.0
Creek
Seneca
R-791
11.8
11.5
9.6
9.5
5.0
CULVERT #1106
CULVERT #1007
0
1000
SCALE IN FEET
S. RIVER WATERSHED Ea
UNION CREEK CULVERT &
LIVE OAK CREEK CULVERT
REPLACEMENTS
SEC. 3, T31S, R8W, WM.


RRC
R-851
Creek
END
AREA OF
RESTORATION
20 ACRES
LOG
BRIDGE
BEGIN
LRT
R-768
RRC
R-851
RRC
R-851
RRC
R-851
Thompson
34.0
34.0
34.0
36.0
36.0
3
2
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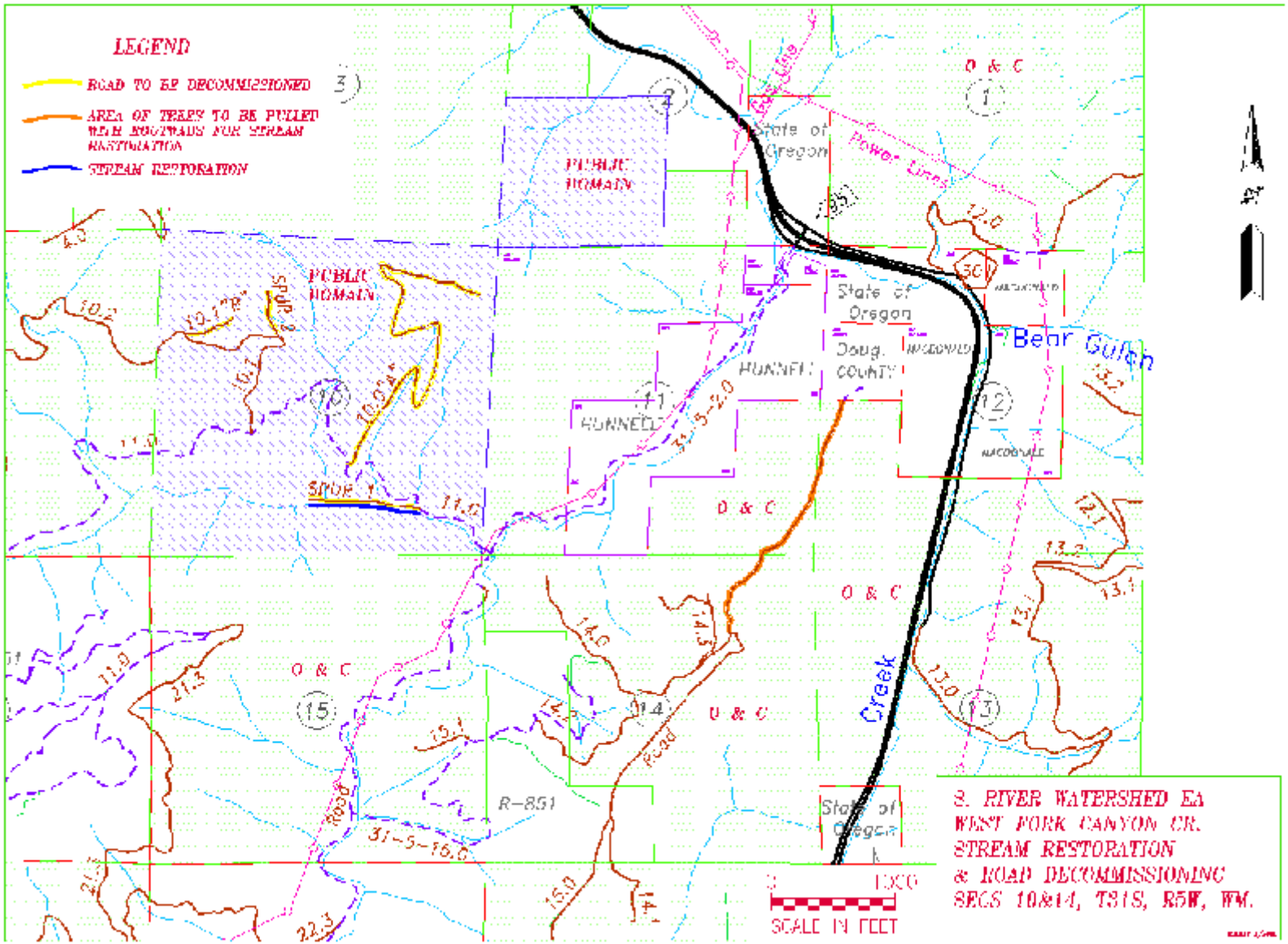
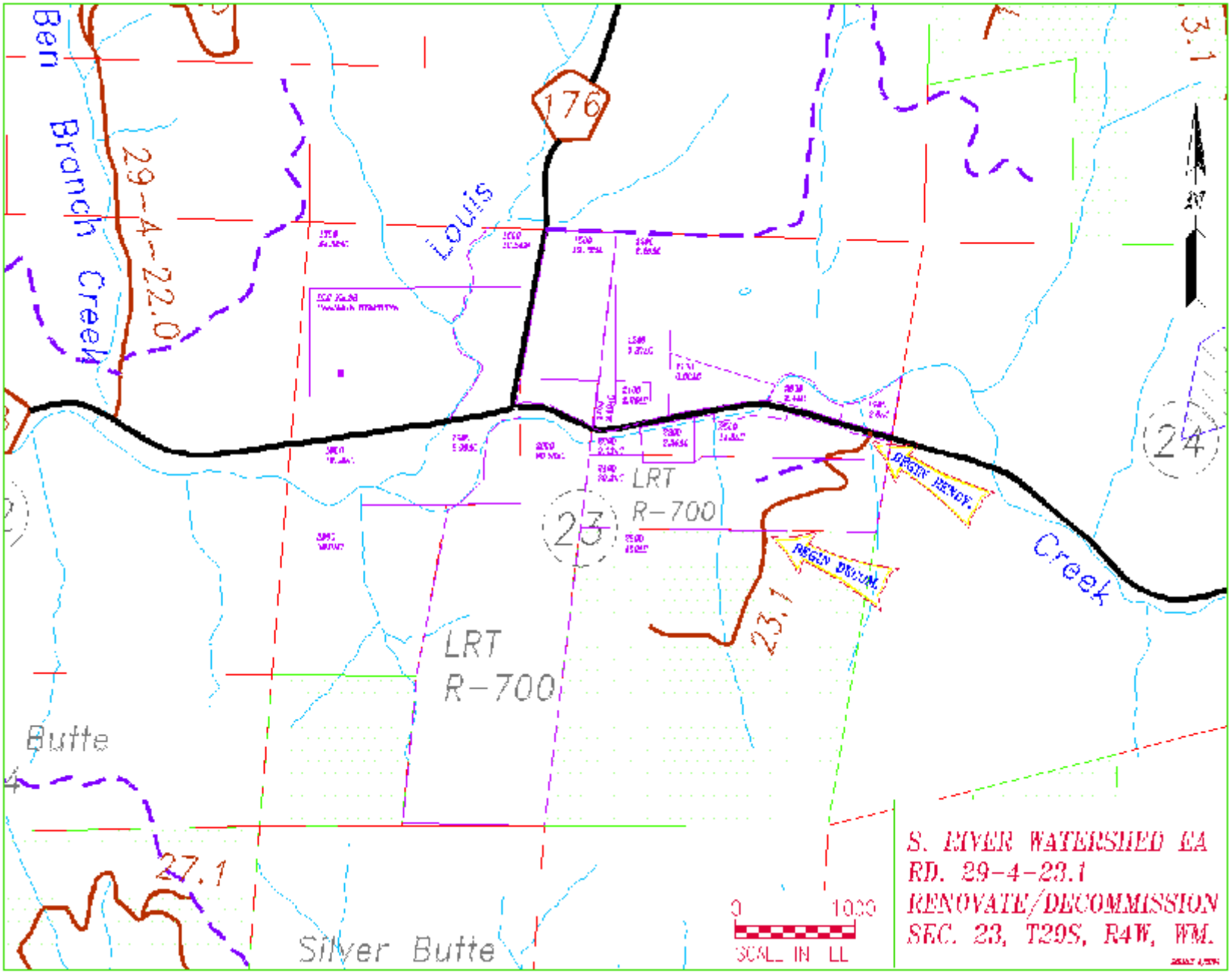
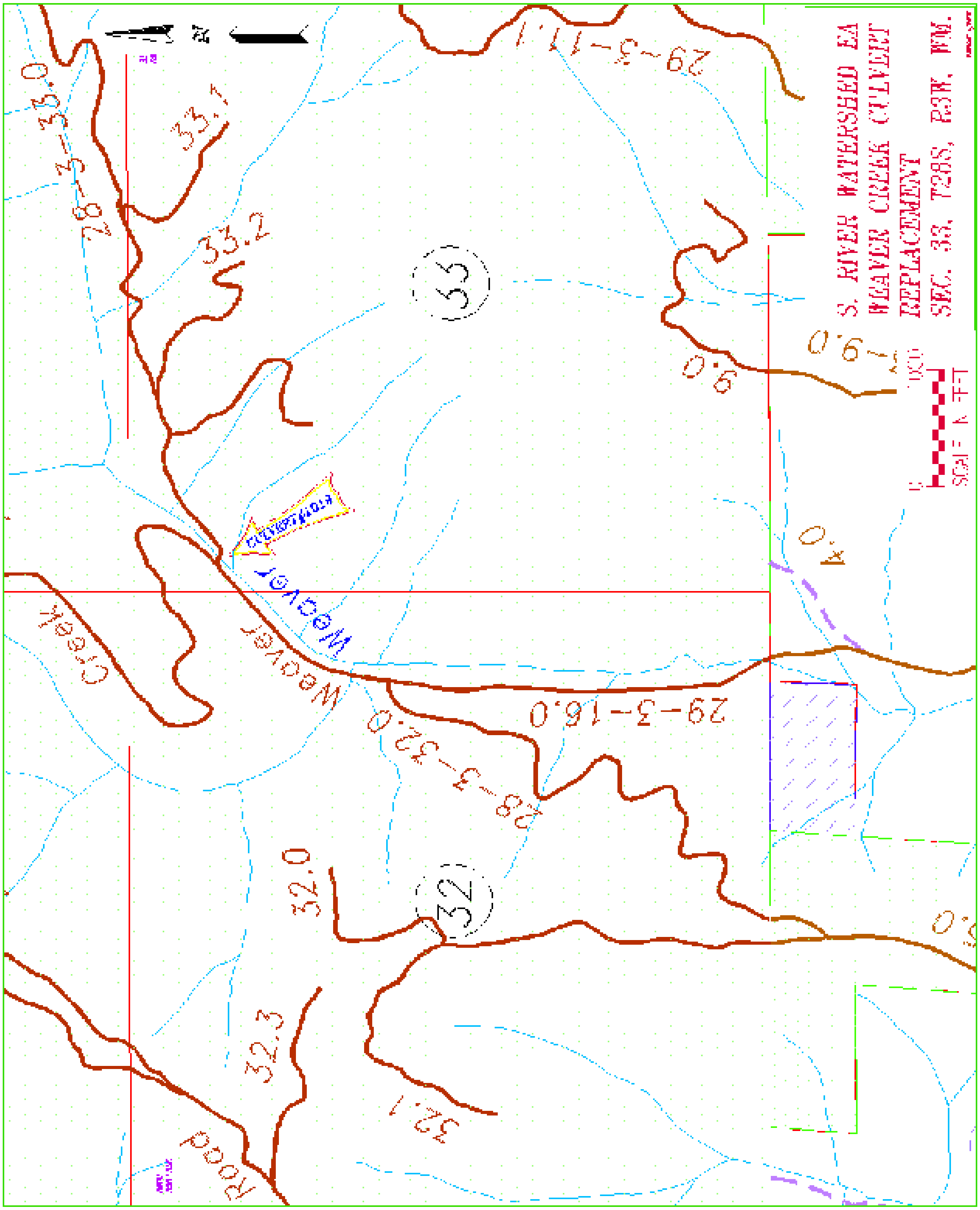
SCALE IN FEET
S. RIVER WATERSHED EA
THOMPSON CREEK
RESTORATION
SEC. 3, T30S, R7W, WM.


LEGEND
ROAD TO BE DECOMMISSIONED
AREA OF TREES TO BE PULLED WITH EXCAVATOR FOR STREAM RESTORATION
STREAM RESTORATION
PUBLIC DOMAIN
State of Oregon
Doug. COUNTY
HUNNELL
MACDONALD
O & C
Bear Gulch
Creek
Road
R-851
Power Line
SCALE IN FEET
3. RIVER WATERSHED EA
WEST FORK CANYON CR.
STREAM RESTORATION
& ROAD DECOMMISSIONING
SECS 10&14, T31S, R5W, WM.


Ben Branch Creek
29-4-22.0
176
Louis
3.1
24
23
LRT
R-700
BEGIN DECOM.
BEGIN RENOV.
Creek
23.1
LRT
R-700
Butte
27.1
Silver Butte
0
1000
SCALE IN LL
S. FIVER WATERSHED EA
RD. 29-4-23.1
RENOVATE/DECOMMISSION
SEC. 23, T29S, R4W, WM.


S. RIVER WATERSHED EA
WEAVER CREEK CULVERT
REPLACEMENT
SEC. 33, T28S, R3W, WM.

APPENDIX B

AQUATIC CONSERVATION STRATEGY

PROJECT CONSISTENCY

EVALUATION

ACS Objectives Analysis for Culvert Removal and Replacement and Construction of Grade Control Structures

This table applies to all culvert projects, unless otherwise described.

Summary of ACS Objectives		**Potential Short-Term* Consequences**	**Potential Long-Term** Consequences**	**Mitigation**
ACS #	"Maintain and restore..."			
1	watershed and landscape-scale features		culvert replacement would promote and improve distribution of aquatic species and their populations in the watershed and between watersheds	
2	spatial and temporal connectivity	aquatic species passage would be interrupted during construction of in-stream grade controls and removal and replacement of culverts	the life span of culverts is highly variable due to local conditions such as stream hydraulics, abrasion by stream substrates, water chemistry, etc...; it is estimated, culverts would last approximately 25-30 years, after this time, the culverts may need to be replaced beneficial effects of culvert removal and replacement and placement of grade control structures in the stream channel are as follows: - downstream and/or migratory aquatic species populations would be reconnected with habitat and populations upstream from culvert site - grade control structures would provide aquatic species with cover, resting pools, and would aggrade the stream channel by accumulating bedload sediments, raising the stream elevation below the culvert allowing aquatic organism passage and spatial connectivity to upstream reaches	application of BMPs for culvert removal and replacement (ROD/RMP App. D, pp. 134-138) to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect
3	physical integrity of aquatic system	short term sedimentation impacting H_2O quality would be from construction of in-stream grade control structures and excavation, removal and replacement of existing culverts, and construction of temporary roads to access culvert and grade control structure sites	stream crossings (i.e. culverts and fill heights) would meet 100-year flood requirements, reducing adverse impacts to stream channel in the future stream downcutting or stream incision and streambank erosion at outlet of culvert would be minimized by design criteria of new culverts	application of BMPs for culvert removal and replacement (ROD/RMP App. D, pp. 134-138) subsoil, seed, and mulch access roads seed and mulch all bare soil areas, and to the extent possible, bioengineering would be used to prevent sedimentation and/or erosion culverts would be designed and sized to meet bankfull stream requirements, and to the extent practical, designed to simulate and accommodate natural stream channel characteristics, thus reducing the influence of the culvert on channel morphology and the chance of culvert failure
4	water quality	same as Obj. #3 (above) removal of existing vegetation and canopy closure at the culvert site would increase solar radiation to stream channel, thermal regulation in the riparian area would be adversely influenced by culvert removal and replacement activities	stream downcutting or stream incision and streambank erosion at outlet of culvert would be minimized by design criteria of new culverts; turbidity would be reduced because downcutting or stream incision and bank erosion at culvert outlet would be minimized	application of BMPs for culvert removal and replacement (ROD/RMP App. D, pp. 134-138)

Summary of ACS Objectives		Potential Short-Term* Consequences	Potential Long-Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
5	sediment regime	same as Obj. #3 (above)	culvert design would accommodate bedload sediments and bankfull streamflow, thus reducing potential future adverse impacts to the sediment regime	application of BMP's for culvert removal and replacement (ROD/RMP App. D, pp. 134-138)
6	in-stream flows	in-stream flow would be interrupted and, in most cases, redirected around the work area during the implementation of the culvert projects peak and high flows would not be an issue with the implementation of culvert projects	in-stream flows would be accommodated by proper culvert design sediment and nutrient routing would be maintained upstream, downstream and through the culvert site culvert placement may negatively impact wood routing and wood recruitment overtime (i.e. woody debris transported via streamflow from upstream reaches may get lodged on the upstream side of the culvert, thus limiting wood contributions to downstream reaches)	application of BMP's for culvert removal and replacement (ROD/RMP App. D, pp. 134-138) road fill over culverts would be designed to meet 100-year flood requirements, and to the extent possible, designed to allow for woody debris to be routed from upstream to downstream reaches grade control structures would be designed to meet 100-year flood requirements
7	floodplain inundation and water table elevation	no adverse short term effects to floodplain or water table in wetlands or meadows are expected from culvert removal and replacement activities or from the placement of in-stream gradient control structures	culvert design would accommodate bankfull streamflow, thus reducing potential future adverse impacts to the streams floodplain gradient control structures would displace water and would promote interaction of the stream with its adjacent floodplain, thus dissipating streamflow energy	culverts would be designed and sized to meet bankfull stream requirements, and to the extent practical, designed to simulate and accommodate natural stream channel characteristics, thus reducing the influence of the culvert on channel morphology and the chance of culvert failure
8	species composition and diversity of plant communities	removal of existing vegetation and canopy closure at the culvert site would increase solar radiation to stream channel, thermal regulation in the riparian area would be adversely influenced by culvert removal and replacement activities the existing vegetation at culvert sites is early seral age conifers, red alder, blackberry, willow sp., and other shrub sp. and not mature/old-growth forest sp.; therefore, culvert sites would not interfere with potential recruitment of LWD	conditions at culvert site would improve over time given reestablishment of riparian vegetation adequate thermal regulation and nutrient filtering would occur following the reestablishment of vegetation at culvert site surface erosion, bank erosion and channel migration and the supply and distribution of coarse woody derbris would occur at appropriate rates with the reestablishment of riparian vegetation	application of BMPs for culvert removal and replacement (ROD/RMP App. D, pp. 134-138) vegetation disturbance located near the culvert site would be kept to a minimum bioengineering techniques would be employed to reestablish vegetation in the disturbed areas
9	habitat to support well-distributed populations of riparian-dependent species	short term adverse effects to local populations by removal of vegetation, compaction and destruction of down woody material may be extensive if scale of project is large	reconnects aquatic habitats benefits to productivity via habitat diversity in stream increase in site quality should result from the slowing of flow and collection of biomass in the aquatic system	position entry roads and work areas in manner as to not concentrate impacts (i.e. no large continuous habitat loss) avoid removal of trees and avoid displacement of DWM utilize existing roads

* short term is defined as 1 to 3 years, unless otherwise described.

** long term is defined in the context of ACS, "...decades, possibly more than a century"(ROD, B-9), unless otherwise described.

ACS Objectives Analysis for In-Stream Habitat Structure Placement

This table applies to all in-stream habitat structure projects, unless otherwise described.

Summary of ACS Objectives		Potential Short Term* Consequences	Potential Long Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
1	watershed and landscape-scale features		in-stream habitat structures promote and improve habitat conditions for aquatic species and their populations in the watershed	
2	spatial and temporal connectivity	aquatic species passage would be interrupted during construction of in-stream habitat structures	in-stream habitat structures promote and improve habitat conditions for aquatic species and their populations in the watershed increases suitable habitat along stream reaches which provides increased spatial and temporal connectivity between basins	a seasonal restriction (July 1-Sept. 15) would be in effect to reduce impact to aquatic species; generally during this time of the year fish are not migrating
3	physical integrity of aquatic system	short term sedimentation impacting H_2O quality from placement of in-stream habitat structures (i.e. 'key' habitat structures into the streambanks, disturbance of stream substrates by equipment) short term sedimentation from construction of temporary roads to access in-stream habitat structure sites	wood debris and rock structures would become incorporated into the stream channel, streambanks, and floodplain and would steer the physical integrity in the stream channel, banks, and bottom configurations towards a more natural condition wood debris accumulations provide cover for aquatic species and retain organic detritus (base of food chain in the aquatic environment)	seed and mulch all bare soil areas, and to the extent possible, bioengineering would be used to prevent sedimentation and/or erosion subsoil, seed, and mulch access roads in-stream habitat structures would be designed and placed to meet bankfull stream requirements, and to the extent practical, designed to simulate and accommodate natural stream channel characteristics
4	water quality	same as Obj. #3 (above) oil, fuel, and hydraulic leaks from mechanized equipment in the stream channel, on streambanks, or in adjacent floodplain area increase in stream temperature at some proposed project sites from additional solar radiation after pulling/felling trees along streambank	same as Obj. #3 (above) decrease in stream temperature as low flows increase, from additional water storage in riparian as channel aggrades, and from regrowth of vegetation (i.e. planting conifers in riparian area of WF Canyon Creek project would reduce solar radiation and decrease stream temperatures in long term)	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect refuel power equipment away from streams, lakes, or wetlands to prevent direct delivery of fuel or oil into a waterbody BMPs for Watershed Restoration and Fish Habitat Improvement Projects would be employed (ROD/RMP pp.141-42)

Summary of ACS Objectives		Potential Short Term* Consequences	Potential Long Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
6	in-stream flows	low, peak, and high flows would not be effected with the construction of in-stream habitat structures	the following conditions would restore in-stream flows: placement of LWD in stream channel would narrow width/depth ratios, reconnect stream to its floodplain, promote sinuosity of stream, increase sediment and water storage, increase stream length to valley length (i.e. lower stream gradient) stream channel characteristics are defined by and created by peak/high flow events; over time aquatic habitat features and in-stream structure would restore timing, magnitude, duration of low, peak and high flows	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect in-stream habitat structures would be designed to meet 100-year flood requirements
7	floodplain inundation and water table elevation	no adverse short term effects to floodplain or water table in wetlands or meadows are expected from placement of in-stream habitat structures	wood embedded in the channel would provide a "stepped" channel profile, lowering stream gradient, creating habitat for aquatic organisms (Meehan 1991), and would promote high and peak flows to interact with the adjacent floodplain	in-stream habitat structures would be designed to meet 100-year flood requirements
8	species composition and diversity of plant communities	removal of existing vegetation from the streambank at the site of a habitat structure would potentially increase solar radiation to stream channel, thermal regulation in the riparian area would likely be adversely influenced by in-stream habitat activities	in the future, thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and the supply of LWD to stream channel would be reestablished with growth of vegetation on the streambanks and in the access roads	vegetation disturbance located near the in-stream habitat structure sites would be kept to a minimum bioengineering techniques would be employed to reestablish vegetation in the disturbed areas
9	habitat to support well-distributed populations of riparian-dependent species	vegetation damage/loss adversely affects habitat quality may create terrestrial pathways to cross water, increasing connectivity between sides of stream	increase in site quality should result from the slowing of flow and accumulation of biomass in aquatic system	avoid concentration of impacts, select live trees to pull without specific habitat features for 'priority wildlife species' (see Wildlife Biologist's report for list of these species) minimize incidental damage to vegetation adjacent to work sites

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ACS Objectives Analysis for Road Renovation and Road Decommissioning

This table applies to all road related projects, unless otherwise described.

Summary of ACS Objectives		Potential Short Term* Consequences	Potential Long Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
1	watershed and landscape-scale features		road renovation and/or road decommissioning would promote and improve habitat conditions for aquatic species and their populations in the watershed removal of roads would ensure long-term recovery of watershed and landscape features	
2	spatial and temporal connectivity	impacts to spatial and temporal connectivity within and between watersheds are not anticipated from road renovation activities; in the case of road decommissioning, culverts or stream crossings removed may temporarily block movement or passage of aquatic organisms	stream crossing removal during road decommissioning would provide increased spatial and temporal connectivity between basins	a seasonal restriction (July 1-Sept. 15) would be in effect to reduce impact to aquatic species
3	physical integrity of aquatic system	short term sedimentation impacting H_2O quality from road renovation activities (i.e. placement of relief culverts, remove/replace stream crossing structures, grading and pulling ditchlines, etc...) short term sedimentation from road decommissioning activities (i.e. road fill pull-back adjacent to streams, culvert removal and streambank recontouring, etc...) Typically, short-term impacts only occur during the actual removal and replacement of stream culverts	stream crossings (i.e. culverts and fill heights) would meet 100-year flood requirements, reducing adverse impacts to stream channel in the future stream downcutting or stream incision and streambank erosion at outlet of culvert would be minimized by design criteria of new culverts armoring road prism/running surface along some sections next to stream, in conjunction with in-stream structures, would reduce erosion and sediment input	seed and mulch all bare soil areas, and to the extent possible, bioengineering would be used to prevent sedimentation and/or erosion subsoil, seed, and mulch decommissioned roads stream crossing/culvert structures would be designed and placed to meet bankfull stream requirements, and to the extent practical, designed to simulate and accommodate natural stream channel characteristics sedimentation is arrested at the site with application of BMPs for culvert replacement (ROD/RMP, pp. 131-138) to reduce impacts to aquatic species, seasonal restrictions (July 1 to Sept. 15) would be in effect
4	water quality	same as Obj. #3 (above) oil, fuel, and hydraulic leaks from mechanized equipment in the stream channel, on streambanks, or in adjacent floodplain area	same as Obj. #3 (above)	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect refuel power equipment away from streams, lakes, or wetlands to prevent direct delivery of fuel or oil into a waterbody BMPs for Watershed Restoration and Fish Habitat Improvement Projects would be employed (ROD/RMP pp.141-42)

Summary of ACS Objectives		Potential Short Term* Consequences	Potential Long Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
5	sediment regime	same as Obj. #3 (above)	same as Obj. #3 (above) sediment regime would remain in the range of natural variability sediment delivery, volume, storage, and transport would vary with each project and/or habitat project site; however, in-stream habitat structures would aid in dispersing streamflow energy, lowering stream velocity, capturing and retaining bedload substrates over time (i.e. >1 year) and space (i.e. stream length) stream sediment, bedload materials, and nutrients would be trapped by the in-stream log structures and routed through the system slowly as the wood accumulations decompose	same as Obj. #3 (above)
6	in-stream flows	low, peak, and high flows would not be effected with the construction of in-stream habitat structures	the following conditions would restore in-stream flows: placement of LWD in stream channel would narrow width/depth ratios, reconnect stream to its floodplain, promote sinuosity of stream, increase sediment and water storage, increase stream length to valley length (i.e. lower stream gradient) stream channel characteristics are defined by and created by peak/high flow events; over time aquatic habitat features and in-stream structure would restore timing, magnitude, duration of low, peak and high flows	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect in-stream habitat structures would be designed to meet 100-year flood requirements
7	floodplain inundation and water table elevation	no adverse short term effects to floodplain or water table in wetlands or meadows are expected from placement of in-stream habitat structures	wood embedded in the channel would provide a "stepped" channel profile, lowering stream gradient, creating habitat for aquatic organisms (Meehan 1991), and would promote high and peak flows to interact with the adjacent floodplain	in-stream habitat structures would be designed to meet 100-year flood requirements
8	species composition and diversity of plant communities	removal of existing vegetation from the streambank at the site of a culverts and oversteepened road fills would potentially increase solar radiation to stream channel, thermal regulation in the riparian area would likely be adversely influenced by in-stream habitat activities	in the future, thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and the supply of LWD to stream channel would be reestablished with growth of vegetation on the streambanks and in the roads designated for decommissioning	vegetation disturbance located near the culvert sites would be kept to a minimum bioengineering techniques would be employed to reestablish vegetation in the disturbed areas
9	habitat to support well-distributed populations of riparian-dependent species	minor adverse impacts to local populations on roadside locations removal of barrier to movement	reconnection of riparian and aquatic systems long term benefit improves water quality/quantity	planting of native species may decrease erosion and establish habitat features

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** long term is defined in the context of ACS, "...decades, possibly more than a century"(ROD, B-9), unless otherwise described.

ACS Objectives Analysis for Streambank Stabilization

This table applies to all streambank stabilization projects, unless otherwise described.

Summary of ACS Objectives		Potential Short Term* Consequences	Potential Long Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
1	watershed and landscape-scale features		streambank stabilization would promote and improve habitat conditions for aquatic species and their populations in the watershed removal and the stabilization of vertical, unvegetated streambank would ensure long-term recovery of watershed and landscape features	
2	spatial and temporal connectivity	impacts to spatial and temporal connectivity within and between watersheds are not anticipated from streambank stabilization activities; when the in-stream structures are being placed at the toe of the streambank slope the movement and passage of aquatic organisms may be temporarily blocked	streambank stabilization would not directly improve or degrade spatial or temporal connectivity within or between watersheds; however indirect effects of a failing or eroding streambank result in increases in sedimentation; sedimentation may discourage or prohibit aquatic organisms utilization of in-stream habitat features and it may discourage the movement and migration patterns of aquatic organisms repairing unstable streambank would reduce sedimentation in future years	a seasonal restriction (July 1-Sept. 15) would be in effect to reduce impact to aquatic species
3	physical integrity of aquatic system	short term sedimentation impacting H_2O quality from streambank stabilization activities (i.e. placement of in-stream structures to dissipate stream energy and hydraulic forces, pulling back streambank material, recontouring the streambank slope, planting vegetation at the streams edge, etc...) short term sedimentation from road decommissioning activities (i.e. road fill pull-back adjacent to streams, culvert removal and streambank recontouring, etc...)	in-stream structures and streambank buttress materials would meet 100-year flood requirements, reducing adverse impacts to stream channel in the future in-stream structures and buttress materials and revegetating the newly contoured streambank would reduce erosion and sediment input at the project site	seed and mulch all bare soil areas, and to the extent possible, bioengineering would be used to prevent sedimentation and/or erosion in-stream structures and streambank buttress materials would be designed and placed to meet bankfull stream requirements, and to the extent practical, designed to simulate and accommodate natural stream channel characteristics
4	water quality	same as Obj. #3 (above) oil, fuel, and hydraulic leaks from mechanized equipment in the stream channel, on streambanks, or in adjacent floodplain area	same as Obj. #3 (above)	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect refuel power equipment away from streams, lakes, or wetlands to prevent direct delivery of fuel or oil into a waterbody BMPs for Watershed Restoration and Fish Habitat Improvement Projects would be employed (ROD/RMP pp.141-42)

Summary of ACS Objectives		Potential Short Term* Consequences	Potential Long Term** Consequences	Mitigation
ACS #	"Maintain and restore..."			
5	sediment regime	same as Obj. #3 (above)	same as Obj. #3 (above) sediment regime would remain in the range of natural variability sediment delivery, volume, storage, and transport would vary with each project and/or habitat project site; however, in-stream habitat structures would aid in dispersing streamflow energy, lowering stream velocity, capturing and retaining bedload substrates over time (i.e. >1 year) and space (i.e. stream length) stream sediment, bedload materials, and nutrients would be trapped by the in-stream log structures and routed through the system slowly as the wood accumulations decompose	same as Obj. #3 (above)
6	in-stream flows	low, peak, and high flows would not be affected by streambank stabilization streambank stabilization would not affect flow timing or magnitude	streambank stabilization would promote the restoration of in-stream flows over time aquatic habitat features and in-stream structure would restore timing, magnitude, duration of low, peak and high flows	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect
7	floodplain inundation and water table elevation	no adverse short term effects to floodplain or water table in wetlands or meadows are expected from streambank stabilization	proposed in-stream structures designed to act as stream energy dissipators would raise the channel bed and reconnect the channel with additional floodplain area	to reduce impact to aquatic species, a seasonal restriction (July 1-Sept. 15) would be in effect
8	species composition and diversity of plant communities	removal of existing vegetation from the streambank site and the removal of oversteepened streambank materials would potentially increase solar radiation to stream channel, thermal regulation in the riparian area would likely be adversely influenced by in-stream structure placement and streambank stabilization activities	in the future, thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and the supply of LWD to stream channel would be reestablished with growth of vegetation on the streambank	vegetation disturbance located near the streambank site would be kept to a minimum bioengineering techniques would be employed to reestablish vegetation in the disturbed areas
9	habitat to support well-distributed populations of riparian-dependent species	removal of vegetation would cause potential adverse impacts to local populations due to loss of habitat extent of habitat loss would not be enough to fragment	vegetation/ regrowth and planting would prevent bank erosion, in turn, creating some increase in riparian habitat at the site level	planting with native trees and shrubs to complement native plants/habitat on the site use existing roads to the extent possible to reduce impacts in the riparian area

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APPENDIX C

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order. These resources or values either **not present** or **would not be affected by the proposed actions or alternative**, unless otherwise described in this EA. This negative declaration is documented below by individuals who assisted in the preparation of this analysis.

ELEMENT	NOT PRESENT	NOT AFFECTED	IN TEXT	INITIALS	TITLE
Air Quality					
Areas of Critical Environmental Concern					
Cultural Resources					
Environmental Justice					
Farm Lands (prime or unique)					
Floodplains					
Non-Native and Invasive Species					
Native American Religious Concerns					
Threatened or Endangered Wildlife Species					
Threatened or Endangered Plant Species					
Wastes, Hazardous or Solid					
Water Quality Drinking/Ground					
Wetlands/Riparian Zones					
Wild & Scenic Rivers					
Wilderness					
Visual Resource Management					